TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

TRAFFIC IMPACT ASSESSMENT (TIA)

Port Macquarie Private Hospital Redevelopment
86-94 Lake Road, Port Macquarie NSW

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Suite 2.08, 50 Holt St
Surry Hills, NSW 2010

t: (02) 8324 8700
w: www.traffix.com.au

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v03	23/06/2023	Stephan Hoang	Ben Liddell	

TRAFFIX

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1. INTRODUCTION

TRAFFIX has been commissioned by Erliyan to undertake a traffic impact assessment (TIA) in support of a development application (DA) relating to a private hospital redevelopment at 86-94 Lake Road, Port Macquarie. The development is located within the Port Macquarie – Hastings Council Local Government Area (LGA) and has been assessed under that Council's controls.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects (SEE) prepared separately. The development does not require referral to Transport for New South Wales (TfNSW) under the provisions of the State Environmental Planning Policy (Transport and Infrastructure) 2021.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Presents the overall study conclusions

2. LOCATION AND SITE

The subject development is known as the Port Macquarie Private Hospital and is located at 86-94 Lake Road, Port Macquarie (Lot 1 of DP1225449). Specifically, it is located on the eastern side of Lake Road, about 130 metres north of Savoy Street. In a regional context, it is located approximately 1.3 kilometres south of the Port Macquarie Town Centre.

The site currently accommodates two (2) hospital buildings which offer a range of services including bariatric, dental, general surgery, gynaecology, ophthalmology, orthopaedic, plastic surgery, urology, vascular, day surgery and other medical services.

The site has a total area of approximately 17,329m^2 with a western frontage to Lake Road measuring approximately 110 metres, an eastern frontage to Parker Street measuring approximately 95 metres, a northern boundary to neighbouring medical facilities measuring approximately 177 metres, and a southern boundary to residential developments measuring approximately 221 metres.

Vehicular access is currently provided via five (5) access driveways including two (2) driveways via Lake Road and three (3) driveways via Parker Street. On-site car parking is distributed across the site with 126 car spaces currently provided.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2** which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

Figure 1: Location Plan

Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Ocean Drive: forms part of a TfNSW Main Road (MR 600) that generally runs in a north-south direction between Gordon Street and Oxley Highway in the north and Nancy Bird Walton Drive (at Kew) in the south. In the vicinity of the site, Ocean Drive is subject to a 70km/h speed zoning with two (2) traffic lanes in each direction separated by a median.
- Lake Road: a local road that generally runs in a northeast-southwest direction between Gordon Street in the north and Oxley Highway in the south. In the vicinity of the site, lake Road is subject to a 40km/h High Pedestrian Activity speed zoning and accommodates a single lane of traffic in each direction within an undivided carriageway. Unrestricted kerbside parking is generally permitted along both sides of the road.
- Parker Street: a local road that runs in a north-south direction between a private driveway in the north and Savoy Street in the south. Parker Street is subject to a 50km/h speed zoning and accommodates two-way travel with unrestricted kerbside parking along both sides of the road.
- Savoy Street: a local road that runs in an east-west direction between a cul-de-sac in the east and Lake Road in the west. Savoy Street is subject to a 50km/h speed zoning and accommodates two-way travel with unrestricted kerbside parking along both sides of the road.
- Hill Street: a local road that runs in an east-west direction between Pacific Drive in the east and a cul-de-sac in the west. Hill Street is subject to a 50km/h speed zoning and accommodates a single lane of traffic in each direction within an undivided carriageway. Unrestricted kerbside parking is generally permitted along both sides of the road.

The site is conveniently located with respect to the local and arterial road networks serving the region, with connection to the north and south (via Lake Road) using Ocean Drive.

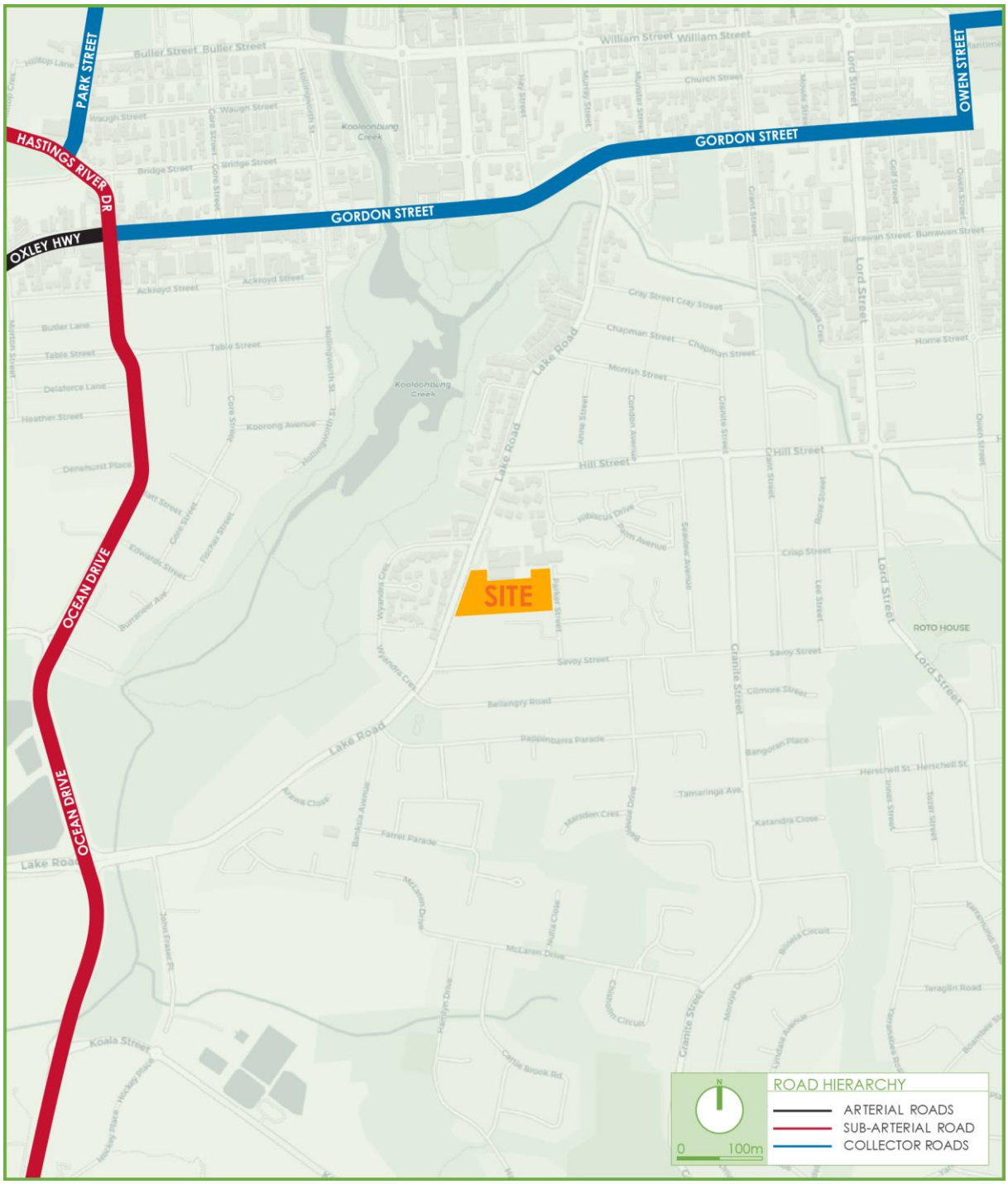


Figure 3: Road Hierarchy

3.2 Key Intersections

Three (3) key intersections have been identified in the vicinity of the site. Theses intersections are located at the junction of main thoroughfares that will be utilised by users of the hospital development.

3.2.1 Lake Road and Hill Street

Figure 4: Intersection of Lake Road and Hill Street

It can be seen from **Figure 4** that the intersection of Lake Road and Hill Street is a four-legged priority-controlled intersection. The main attributes of each approach are outlined below.

- Lake Road (north and south legs):
  - The northbound approach provides one (1) through lane. Left and right turns onto Hill Street are permitted.
  - The southbound approach provides one (1) through lane. Left and right turns onto Hill Street are permitted.

- Hill Street (east and west legs):
  - The east leg of Hill Street provides one (1) through lane. Left and right turns onto Lake Road are permitted.
  - The west leg of Hill Street provides one (1) through lane. Left and right turns onto Lake Road are permitted.

3.2.2 Lake Road and Savoy Street

Figure 5: Intersection of Lake Road and Savoy Street

It can be seen from **Figure 5** that the intersection of Lake Road and Savoy Street is a three-legged priority-controlled intersection. The main attributes of each approach are outlined below.

- Lake Road (north and south legs):
  - The northbound approach provides one (1) through lane. Right turns onto Savoy Street are permitted.
  - The southbound approach provides one (1) through lane. Left turns onto Savoy Street are permitted.

- Savoy Street (east leg):
  - The westbound approach provides a single through lane from which left and right turns onto Lake Road are permitted.
  - A pedestrian refuge is provided at the intersection to facilitate safe pedestrian movements along Lake Road.

3.2.3 Savoy Street and Parker Street

Figure 6: Intersection of Savoy Street and Parker Street

It can be seen from **Figure 6** that the intersection of Savoy Street and Parker Street is a three-legged priority-controlled intersection. The main attributes of each approach are outlined below.

- Savoy Road (east and west legs):
  - The eastbound approach provides one (1) through lane. Left turns onto Parker Street are permitted.
  - The westbound approach provides one (1) through lane. Right turns onto Parker Street are permitted.

- Parker Street (north leg):
  - The southbound approach provides a single lane from which left and right turns onto Savoy Street are permitted.

3.3 Existing Intersection Volumes

3.3.1 Peak Hour Volumes

Intersection surveys were conducted of the three (3) key intersections surrounding the site in May 2023. From this, traffic volume data was obtained regarding the existing peak hour conditions in the morning and evening. The total traffic volumes through each key intersection in the critical AM and PM peak hours are summarised below.

- Lake Road and Hill Street
  - 1,122 vehicles in the AM peak hour; and
  - 1,189 vehicles in the PM peak hour.
- Lake Road and Savoy Street
  - 1,410 vehicles in the AM peak hour; and
  - 1,514 vehicles in the PM peak hour.
- Savoy Street and Parker Street
  - 736 vehicles in the AM peak hour; and
  - 507 vehicles in the PM peak hour.

3.3.2 Daily Volumes

No TfNSW traffic volume counters are available in the vicinity of the site and the intersection surveys were conducted for the critical morning and evening peak periods only. It should be noted that in accordance with *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management*, peak hour volumes are approximately 8 to 10% of the Average Annual Daily Traffic (AADT) for urban situations. Therefore, the following daily volumes (estimates) can be derived from the peak hour (greater of AM and PM volumes) surveys:

- Lake Road and Hill Street 11,220 to 14,862 vehicles/day
- Lake Road and Savoy Street 14,100 to 18,925 vehicles/day
- Savoy Street and Parker Street 5,070 to 9,200 vehicles/day

It is noteworthy that daily traffic volumes are not a relevant consideration for the assessment of the traffic network, which is based on intersection performance during peak (hourly) periods.

3.4 Existing Traffic Generation

Driveway traffic generation surveys were conducted at the five (5) vehicle access points in May 2023. This included the shared driveway that services The Grange car park which operates separately from the subject development and as such, the below results are considered conservative. The below volumes can be used to derive a site-specific traffic generation rate.

- AM Peak 109 vehicle movements (75 in, 34 out); and
- PM Peak 125 vehicle movements (48 in, 77 out).

The distribution of traffic movements (average of peak periods) between the Lake Road accesses and Parker Street accesses is as follows:

- Lake Road 64%
- Parker Street 36%

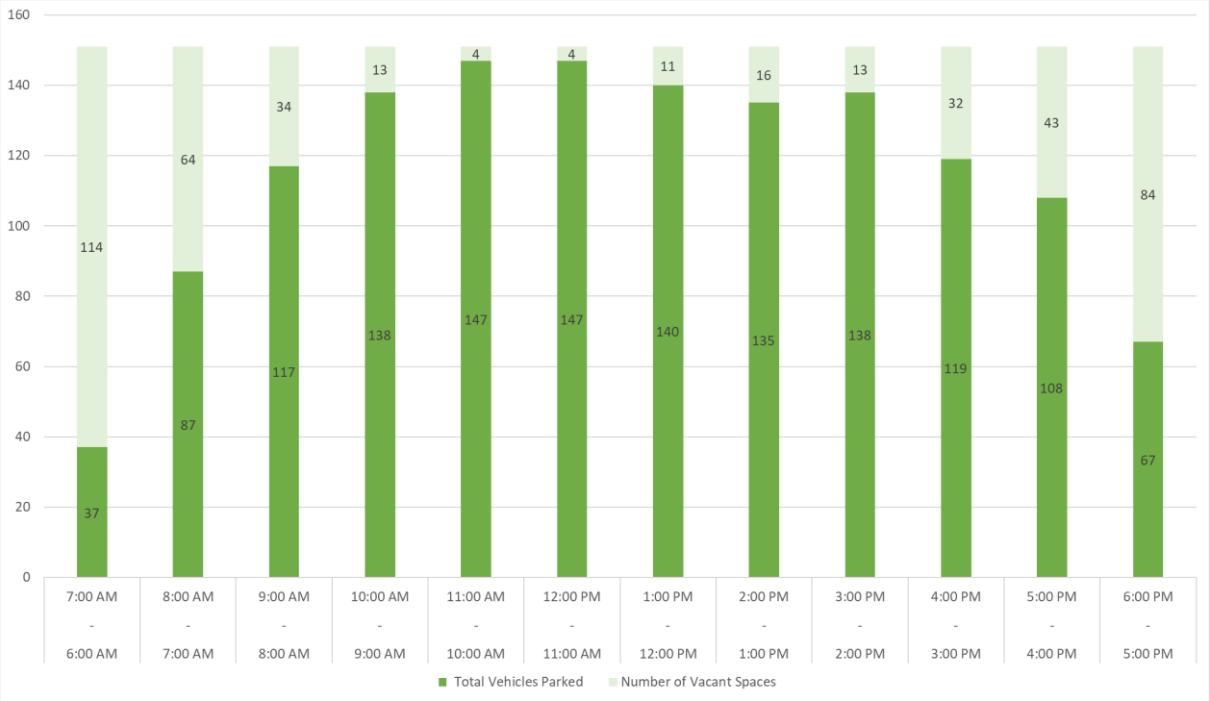
It is noted that the existing hospital has a GFA of approximately 5,320m^2. The existing traffic generation and existing GFA can be used to derive a site-specific traffic generation rate that can be used to estimate the additional traffic associated with the subject application. Application of the above traffic movements results in the following site-specific traffic generate rates:

- 2.0 vehicles per 100m^2 GFA in the AM peak period; and
- 2.3 vehicles per 100m^2 GFA in the PM peak period.

3.5 Existing On-site Parking Demands

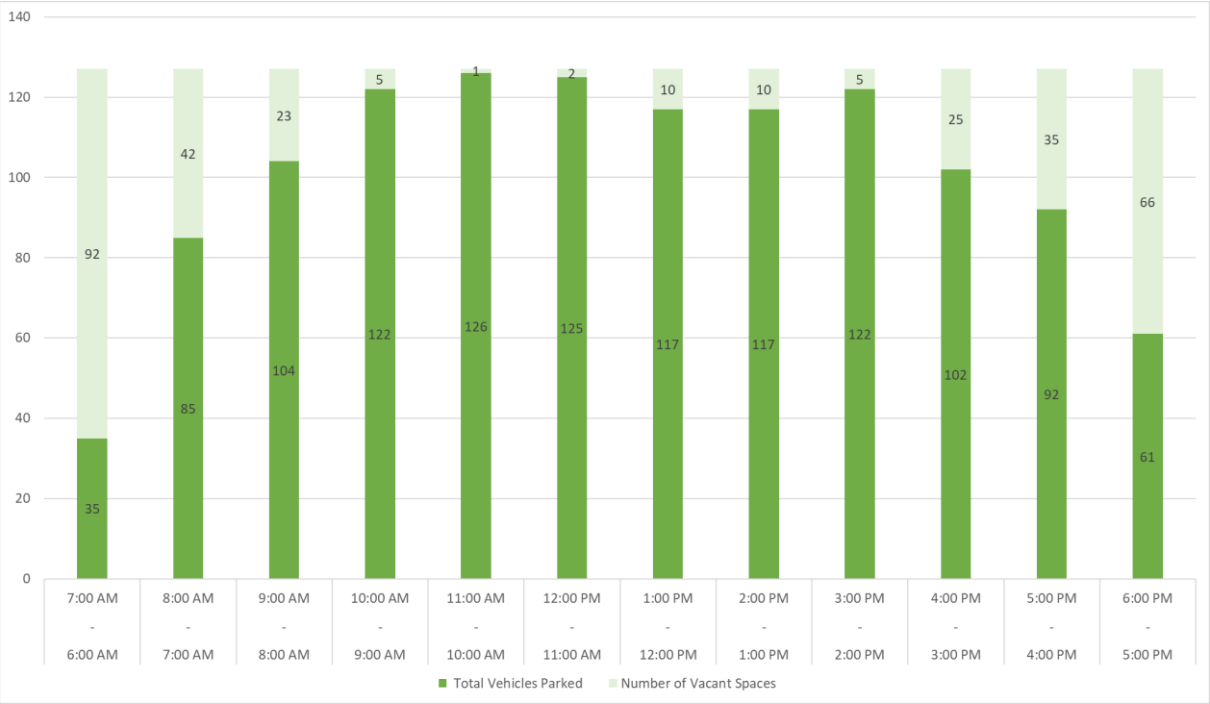
On-site car parking demands were surveyed in May 2023. The surveys were conducted between 6am and 6pm at 60min intervals. The results of the parking surveys are detailed in **Chart 1** and **Chart 2** below. The results also include a single informal parking space off Parker Street commonly used by staff.

Chart 1: On-site Car Parking Survey (Includes 'The Grange' Rear Car Park)



As can be seen from the Chart 1 (holistic assessment), car parking demands peak between 10am and 12pm, with 4 spaces free. Either side of this peak, spare capacity ranges between 13 - 114 spaces between 6am and 10am and 11 - 84 spaces between 12pm and 6pm. It is clear from Chart 1 that the peak on-site parking demands do not coincide with the peak evening on-street parking demands when residents return home from work.

Chart 2: On-site Car Parking Survey (Excludes 'The Grange' Rear Car Park)



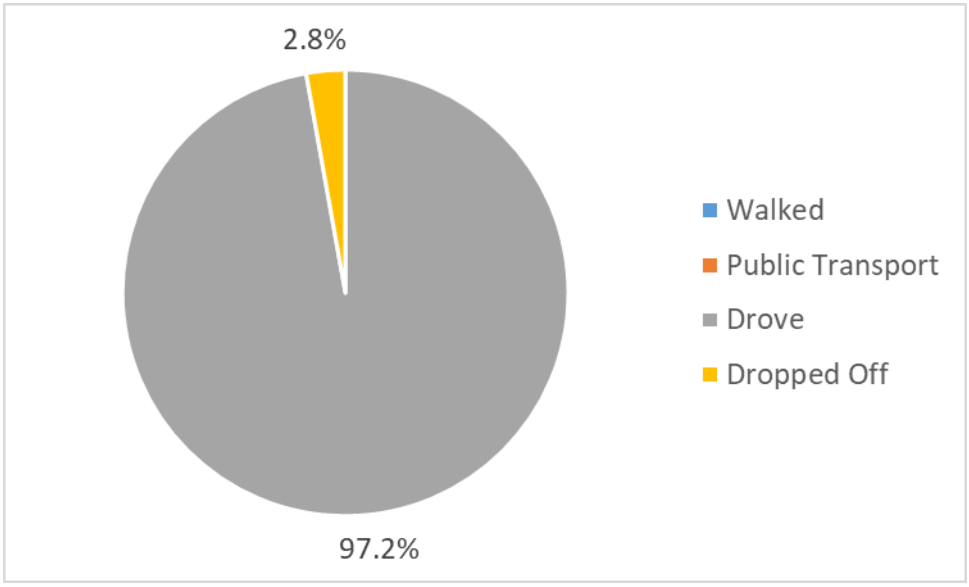
As can be seen from the Chart 2, car parking demands peak between 10am and 12pm, with 1-2 spaces free. Either side of this peak, spare capacity ranges between 5 - 92 spaces between 6am and 10am and 5 - 66 spaces between 12pm and 6pm. It is clear from Chart 1 that the peak on-site parking demands do not coincide with the peak evening on-street parking demands when residents return home from work.

3.6 Existing Travel Characteristics

In order to determine the existing travel characteristics of staff, patients, and visitors travelling to/from the site, travel mode questionnaire surveys were conducted. Surveys of the subject site is considered the best source of data noting the hospital is currently operating.

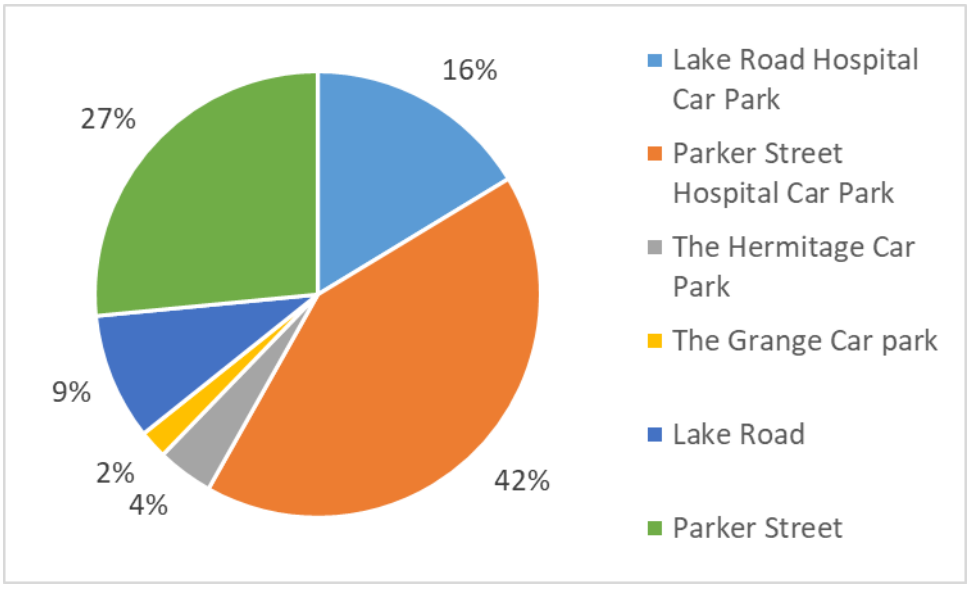
The travel mode survey results for May 2023 are shown in the charts below:

Chart 3: Staff Travel Modes



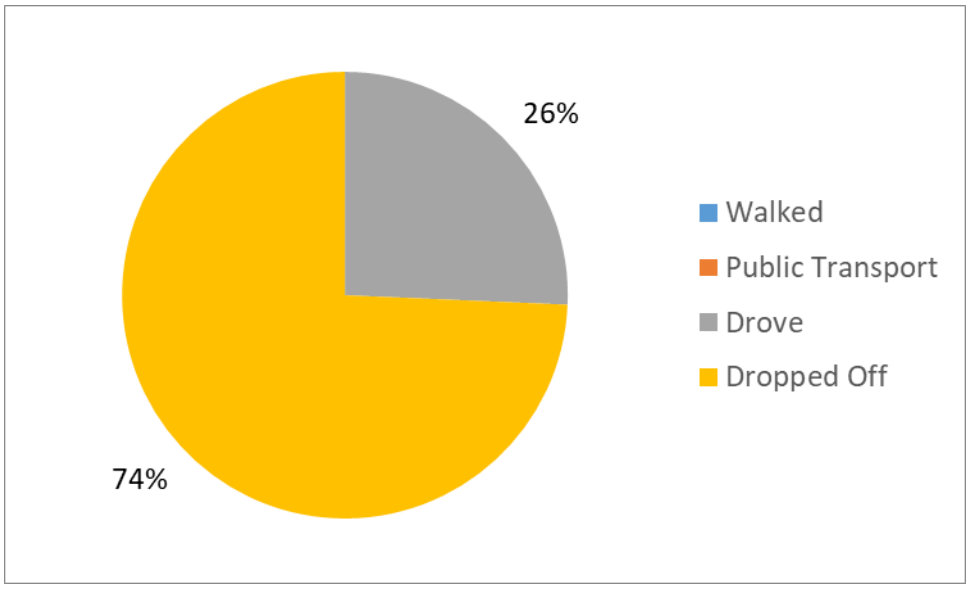
As can be seen from the Chart 3 above, 97% of staff travel to/from site via private vehicle.

Chart 4: Staff Parking Locations



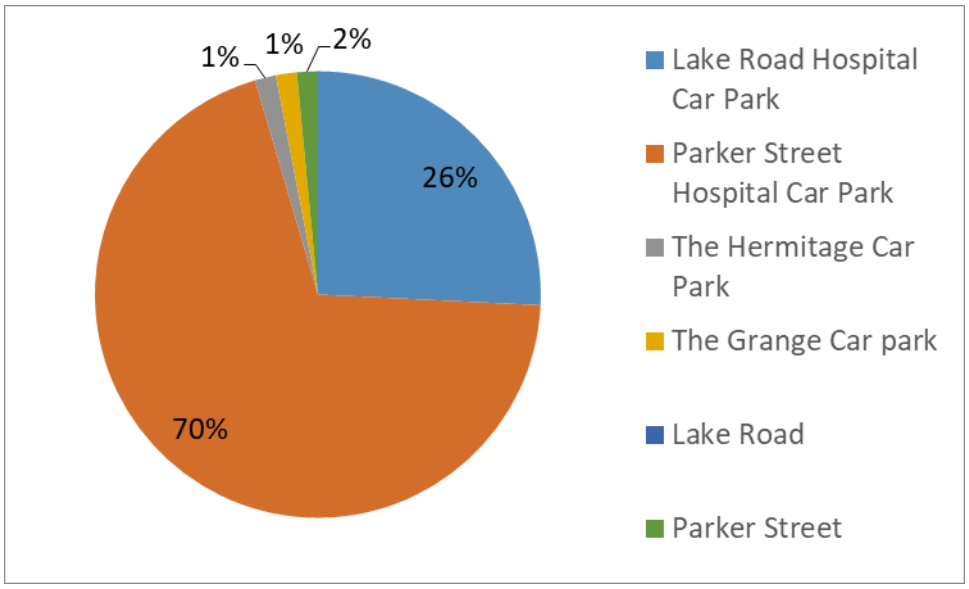
As can be seen from the Chart 4 above, the majority (60%) of staff park within the site.

Chart 5: Patient Travel Modes



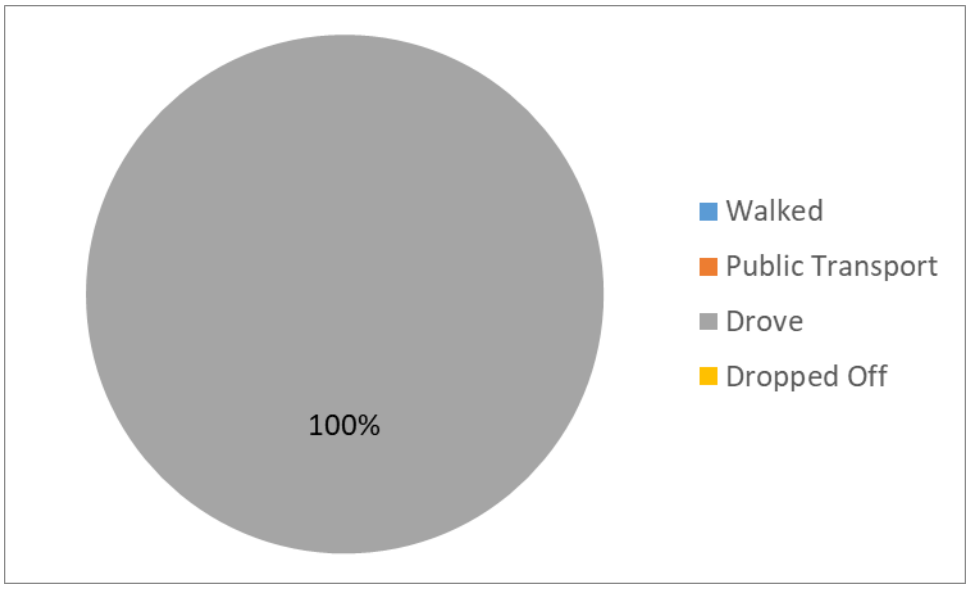
As can be seen from the Chart 5 above, 74% of patients are dropped off and 26% drive.

Chart 6: Patient Parking Locations



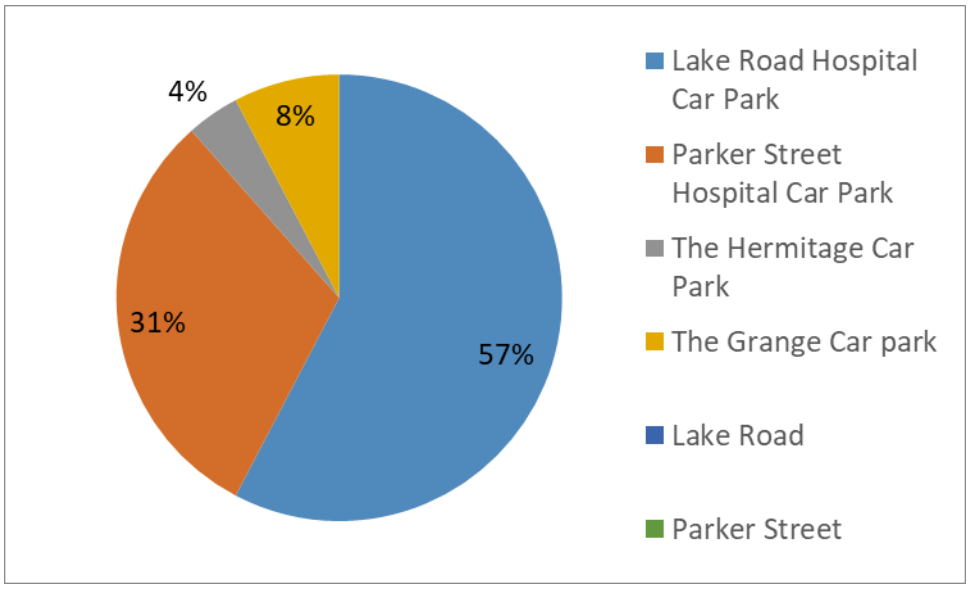
As can be seen from the Chart 6 above, the majority (97%) of patients park within the site.

Chart 7: Visitor Travel Modes



As can be seen from the Chart 7 above, 100% of visitors drive to site.

Chart 8: Visitor Parking Locations



As can be seen from the Chart 8 above, the majority (96%) of visitors' park within the site.

3.7 Public Transport

The existing bus services that operate in the locality are shown in **Figure 7**. It is evident that the development benefits from good bus services with bus stops along the western frontage of the development. These bus routes are listed below, with the frequencies listed in **Table 1**.

- 323 - Port Macquarie to Lighthouse Beach (Loop Service)
- 324 - Port Macquarie Marbuk Ave to Settlement City
- 327 - Port Macquarie to MacKillop College (Loop Service)
- 329 - Settlement City to Port Macquarie Yarranabee Rd (Loop Service)
- 333 - Kendall to Port Macquarie via Bonny Hills
- 334 - Lighthouse Plaza to Settlement City

Table 1: Bus Frequencies

Route No.	Mondays to Fridays	Saturday	Sunday and Public Holidays
323	Limited to up to 6 services	Limited to 5 services	Limited to 2 services
324	Every 1 hour	Every 1 hour	Limited to 5 services
327	Limited to 2 services	-	-
329	Limited to 2 services	-	-
333	Every 2 hour	Limited to 6 services	Limited to 5 services
334	Limited to 9 services	Limited to 6 services	Limited to 4 services

More information concerning all bus and train service information can be found on the Transport for NSW Info website: https://www.transportnsw.info.

3.8 Active Travel

The existing pedestrian and cycling infrastructure in the vicinity of the site is good with most streets having at least a single footpath with kerb pedestrian crossings. As mentioned above, Lake Road (near site) is subject to a 40km/h High Pedestrian Activity Area with multiple traffic calming treatments, including two (2) raised pedestrian refuges that provide convenient

pedestrian access across Lake Road. Lake Road provides paved footpaths along both side of the road within the vicinity of the subject development.

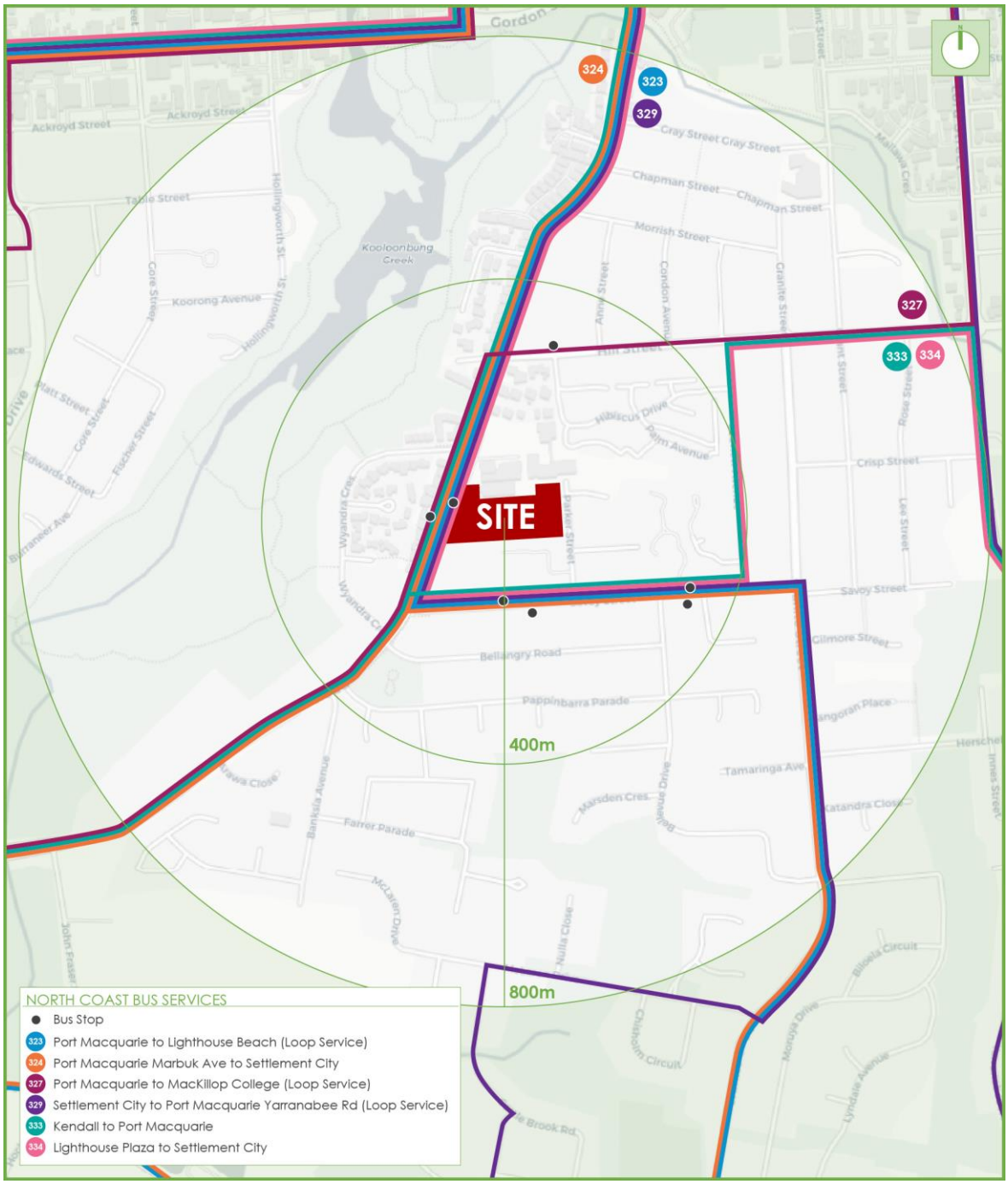


Figure 7: Public Transport

4. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the proposed development is provided in the Statement of Environmental Effects prepared separately. In summary, the development for which approval is now sought is the expansion of the existing private hospital development comprising the following components:

- Staged expansion of the existing private hospital as per **Table 2** below:

Table 2: Summary of Proposed Changes

Hospital Component	Existing	Stage 1	Stage 2
Gross Floor Area	5,320m^2	7,231m^2	8,229m^2
Beds	72	72	101 (+29)
Staff (max. on-site)	125	135 (+10)	150 (+25)
Doctors (max. on-site)	18	26 (+8)	30 (+12)
Operating Theatres	6	7 (+1)	8 (+2)
Consulting Suites	0	5 (+5)	5 (+5)
Clinic	Continues to Operate	Continues to Operate	Removed and replaced with car parking
Medical Imaging	NA	+306m^2	+306m^2
Pharmacy	NA	+44m^2	+44m^2
Car Parking	126	125 (-1)	144 (+18)

- Expansion of the existing administration areas, CSSD, café and day surgery/recovery bed area.
- New ambulance bays and porte cochere;
- Construction an additional 21 car parking spaces in Stage 2;
- No changes are proposed to the existing service/loading bay;
- No changes are proposed to the sites access arrangements to Lake Road or Parker Street.

The parking and traffic impacts arising from the development are discussed in **Section 5** and **Section 6**. Reference should be made to the plans submitted separately to Council which are presented at reduced scale in **Appendix A**.

5. PARKING REQUIREMENTS

5.1 Car Parking

5.1.1 Background

The subject site is situated within the Port Macquarie - Hastings Council LGA and is subject to the Port Macquarie - Hastings Council Development Control Plan 2013. Part B4 of the DCP does not provide car parking rates for hospital developments, including private hospitals. In this regard, a "first principles" approach derived from the existing travel characteristics and operational details for the development is considered more appropriate for establishing parking demands. In order to determine the parking demands associated with the hospital expansion, the travel characteristics outlined in **Section 3.6** have been utilised. The parking demands for each hospital component are outlined in the following sections.

5.1.2 Number of Beds

The following aspects have been utilised to derive the parking demands associated with hospital beds:

- Increase in number of beds (0 for Stage 1 and 29 for Stage 2)
- Percentage of patients driving (26%)
- 85th percentile demand factor (85%)

Application of the above to the proposed Stage 1 and Stage 2 bed increases results in the following demands:

- Stage 1: 0 spaces; and
- Stage 2: 6 spaces.

5.1.3 Staff and Doctors

The following aspects have been utilised to derive the parking demands associated with staff and doctors:

- Increase in number of staff & doctors (18 for Stage 1 and 37 for Stage 2)
- Percentage of staff/doctors driving (97%)
- Percentage of staff/doctors parking on-site (60%)

Application of the above to the proposed Stage 1 and Stage 2 staff/doctor increases results in the following demands:

- Stage 1: 11 spaces; and
- Stage 2: 22 spaces.

It is noteworthy that Council's DCP nominally requires 1 space per 2 employees for other health land uses (medical centres, health consulting rooms), which suggests that a portion of staff will travel via alternative means of travel or park on-street. As such, the 60% rate adopted above is considered more conservative than Council's DCP rate for similar developments.

5.1.4 Operating Theatres

The proposal seeks a minor increase (+2 theatres) in the number of operating theatres. Noting the nature of these services (major surgery with overnight stays), patients undergoing operations will generally not drive to site and will be dropped off. Operating theatre stays have been accounted for in the bed assessment above. As such, no parking demands are associated with the increase in operating theatres.

5.1.5 Consulting Suites

The following aspects have been utilised to derive the parking demands associated with consulting suites:

- Increase in number of suites (5 for Stage 1 and 5 for Stage 2)
- Percentage of patients driving (26%)
- Number of patients per suite at any one time (3 patients)

Application of the above to the proposed Stage 1 and Stage 2 suite increases results in the following demands:

- Stage 1: 4 spaces; and
- Stage 2: 4 spaces.

5.1.6 Medical Imaging

The proposal seeks to provide a 306m^2 medical imaging suite. The following aspects have been utilised to derive the parking demands associated with the medical imaging suite:

- RTA Medical Centre Parking Rate (4 spaces per 100m^2 GFA)
- Gross Floor Area (306m^2)
- Synergy Factor between Uses (50% Reduction)

Application of the above to the proposed Stage 1 and Stage 2 GFA increases results in the following demands:

- Stage 1: 6 spaces; and
- Stage 2: 6 spaces.

5.1.7 Pharmacy

The proposal seeks to provide a 44m^2 pharmacy in Stage 1. The small-scale pharmacy is considered ancillary to the hospital use and pharmacy staff increases have been accounted for in the staff assessment above. As such, no parking demands are associated with the pharmacy.

5.1.8 Clinic (Removal)

The following aspects have been utilised to derive the parking demands associated with the removal of the clinic:

- Number of suites (5 removed for Stage 2)
- Percentage of patients driving (26%)
- Number of patients per suite at any one time (3 patients)

Application of the above to the results in the following demands:

- Stage 1: No Applicable; and
- Stage 2: -4 spaces.

5.1.9 Day Surgery and Recovery Beds

The proposal seeks to expand the day surgery and recovery bed area. It is understood that this expansion relates to an improved operational layout only. Day surgery stays have been accounted for in the bed assessment above. As such, no parking demands are associated with the expansion of the day surgery areas.

5.1.10 Café

The proposal seeks to amend the existing café in Stage 1. The café is considered ancillary to the hospital use (unlikely to attract outside visitors) and café staff increases (if any) have been accounted for in the staff assessment above. As such, no parking demands are associated with the amended café.

5.1.11 Administration Areas

The proposal seeks to expand the existing administration areas. Administration staff increases have been accounted for in the staff assessment above. As such, no parking demands are associated with the expansion of the administration areas.

5.1.12 CSSD Areas

The proposal seeks to expand the existing CSSD areas. CSSD staff increases have been accounted for in the staff assessment above. As such, no parking demands are associated with the expansion of the CSSD areas.

5.1.13 Overall Car Parking Demands

The overall car parking demands associated with the Stage 1 and Stage 2 uses are outlined in **Table 3** below:

Table 3: Overall Parking Demands

Hospital Component	Stage 1	Stage 2
Beds	0	6
Staff	6	15
Doctors	5	7
Operating Theatres	0	0
Consulting Suites	4	4
Medical Imaging	6	6
Pharmacy	0	0
Clinic	NA	-4
Day Surgery Expansion	0	0
Café	0	0
Administration	0	0
CSSD	0	0
New Demand	**+21**	**+34**
Existing MAXIMUM Demand (See Section 3.5)	**126**	**126**
Total MAXIMUM Demands	**147**	**160**
Total Provision	**125**	**144**
Difference	**22**	**16**

5.1.14 Car Parking Discussion

As can be seen from Table 3 above, Stage 1 has a parking demand of 21 additional spaces and Stage 2 has a parking demand of 34 additional spaces over existing demands (126 spaces). The proposed development provides at total of 125 spaces for Stage 1 and 144 spaces for Stage 2. These provisions are considered acceptable in this circumstance for the following reasons:

i. The site is constrained, with existing buildings and limited space to provide additional compliant car parking;

ii. Anecdotal evidence by the hospital operator suggests that visitors and staff of nearby health services park within the site. It is noted that the on-site car parking demand surveys could not distinguish between hospital users and off-site users, thus the survey results likely demonstrate demands above existing hospital demands;

iii. Over the course of a 12-hour day, there is an average of 26 parking spaces currently available within the subject site;

iv. When including the rear car parking spaces of The Grange (holistic assessment), there is an average of 36 parking spaces currently available over the course of a 12-hour day;

v. The on-site car parking demands peak for only two (2) hours between 10am and 12pm. Either side of this two (2) hour window, the availability of car parking ranges between 5 to 92 spaces between 6am and 10am and 5 to 66 spaces between 1pm to 6pm. As such, there is small window in the middle of the day in which on-site carparking will experience high demands. This period (10am-12pm) does not coincide with the weekday evening peak when demand for on-street parking is highest (residents returning home from work), further reducing impacts in the immediate area;

vi. The development is ideally located with regard to alternative modes of transport as discussed above, in relation to active and public transport. It is therefore recommended that a 'Green Travel Plan' be prepared in response to a suitable condition of consent. There is a unique opportunity to contribute to the increase in the number of trips by public transport which is considered an important relevant State target regarding the subject development. It is recommended that a 'Travel Access Guide' be prepared and provided to staff and visitors via appropriate communication channels. The plan would include community information such as local bus network maps and timetables, rail network maps and timetables, cycle route maps, and taxi contact numbers. By providing this information to staff and visitors and ensuring that they are aware of the public transport options and frequencies available to them as well as the location of relevant services, a reduction in car-oriented trips to/from the site would be expected. The preparation of a 'Green Travel Plan' is therefore strongly

supported and would encourage the use of alternative transport options. The implementation of a 'Green Travel Plan' would seek to reduce estimated parking demands, specifically staff and visitor demands; and

vii. The subject proposal seeks to provide upgraded and improved medical services for the community and offers substantial public benefits in this regard, which outweigh the minor parking impacts.

In summary, the subject development is considered supportable in the circumstances for the reasons outlined above.

5.2 Accessible Parking

The Building Code of Australia (BCA) requires Class 9a buildings to provide 1 accessible space for every 50 car parking spaces or part thereof. In response, the proposed development provides a total of three (3) accessible spaces, meeting the minimum requirements of the BCA.

5.3 Bicycle Parking

The Port Macquarie - Hastings Council Development Control Plan 2013 does not provide bicycle parking rates for hospital developments. Nevertheless, bicycle parking could be provided in accordance with *Cycle Aspects of Austroads Guides (2017)* publication. The guide recommends the following bicycle parking rates for hospital developments:

- 1 space per 15 hospital beds (Staff); and
- 1 space per 30 hospital beds (Visitor).

Application of the above rates to the proposed 101 beds, results in a total requirement for 10 bicycle spaces, comprising seven (7) staff spaces and three (3) visitor spaces. A suitable condition requiring a total provision of 10 bicycle parking spaces could be included in any Notice of Determination.

5.4 Motorcycle Parking

The Port Macquarie - Hastings Council Development Control Plan 2013 does not provide motorcycle parking rates for any land uses, and as such, the proposed development does not provide any motorcycle parking spaces.

5.5 Loading and Servicing

The existing development provides a loading dock area on the Ground Floor which is currently accessed via Lake Road (northern driveway). No changes are proposed to this access arrangement under the subject DA with continue use of the northern driveway. The application does not propose significant amendments to the existing (approved) servicing arrangements which have been operating sufficiently for the existing development and shall continue to be sufficient for the proposed extension.

5.6 Ambulance Bays

Two (2) ambulance bays are proposed within the development. The ambulance bays have been designed to accommodate a standard 6.4m Small Rigid Vehicle (considered comparable to a standard NSW ambulance), providing a bay 3.5m wide and 6.4m long. A minimum head height clearance of 3.5m is required above all areas traversed by the ambulances in accordance with AS 2890.2 (2018) and NSW Ambulance specifications.

6. TRAFFIC AND TRANSPORT IMPACTS

6.1 Existing Site Generation

As discussed in Section 3.4, driveway traffic generation surveys were conducted at the five (5) vehicle access points in May 2023. This included the shared driveway that services The Grange car park which operates separately from the subject development and as such, the below results are considered conservative. The existing traffic generation is outlined below:

- AM Peak 109 vehicle movements (75 in, 34 out); and
- PM Peak 125 vehicle movements (48 in, 77 out).

6.2 Development Peak Trip Generation

As discussed in Section 3.4 above, the site-specific traffic generation rates derived from driveway surveys is as follows:

- 2.0 vehicles per 100m^2 GFA in the AM peak period; and
- 2.3 vehicles per 100m^2 GFA in the PM peak period.

Application of the above rates to the Stage 1 and Stage 2 GFA increases results in the following:

Stage 1

- AM Peak +34 vehicle movements (+24 in, +10 out); and
- PM Peak +39 vehicle movements (+16 in, +23 out).

Stage 2

- AM Peak +52 vehicle movements (+36 in, +16 out); and
- PM Peak +60 vehicle movements (+24 in, +36 out).

The above volumes are an increase over the existing conditions. As such, the Stage 2 traffic volumes are considered the relevant volumes for assessment and have been modelled in SIDRA Intersection software.

6.3 Traffic Distribution

The proposed development retains the existing driveway access points via Lake Road and Parker Street. Based on the driveway surveys detailed in Section 3.2, traffic to/from the site is distributed at the following ratios:

- Lake Road 64%
- Parker Street 36%

For the purpose of this assessment, it is assumed that post Stage 2 traffic will be distributed at the same percentages. Therefore, **Table 4** outlines the traffic volumes at each access point:

Table 4: Stage 2 Traffic Distribution

Frontage Road	Peak Period			
	AM		PM	
	52 veh		60 veh	
	IN	OUT	IN	OUT
	36	16	24	36
Lake Road	23	10	15	23
Parker Street	13	6	9	13

The traffic at the Lake Road accesses is further distributed to the north and south at a 50/50 ratio, noting the proximity of nearby road connections and residential areas. The Parker Street traffic is also distributed at the Parker Street/Savoy Street intersection at a 50/50 ratio.

6.4 Modelling Scenarios

In order to assess the potential traffic impacts of a proposed development, the following scenarios were identified:

- 2023 Existing Scenario
- 2023 Existing plus Development Scenario

6.5 Peak Period Intersection Performance

Traffic surveys were undertaken of the intersections mentioned above in **Section 3.3**, which are considered to be most critical in relation to the site. These counts were undertaken on the 9th of May 2023 during the network peak periods, being between 7:00am and 9:00am (morning peak period) and 4:00pm and 6:00pm (evening peak period).

The traffic volumes in these surveys formed the base case volumes for software modelling undertaken to assess intersection performance characteristics under existing traffic conditions. The SIDRA Intersection 9 model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations:

DoS - the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS - this is a comparative measure which provides an indication of the operating performance of an intersection as shown in **Table 5** below.

Table 5: Intersection Performance Indicators (TfNSW)

Level of Service (LoS)	Average Delay per Vehicle (sec/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 space capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	42 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode or major treatment

A summary of the modelled results is provided below in **Table 6**. Reference should also be made to the SIDRA outputs provided in **Appendix B** which provide detailed results for individual lanes and approaches.

Table 6: Existing and Proposed Intersection Performances

Intersection	Control	Scenario	Period	DoS	Ave Delay (s)	LoS
Lake Road and Hill Street	Priority	Existing	AM	0.348	20.0	C
		Exist + Dev		0.353	20.5	C
		Existing	PM	0.331	20.5	C
		Exist + Dev		0.340	21.2	C
Lake Road and Savoy Street	Priority	Existing	AM	0.402	16.9	C
		Exist + Dev		0.414	17.5	C
		Existing	PM	0.533	21.4	C
		Exist + Dev		0.547	22.4	C
Savoy Street and Parker Street	Priority	Existing	AM	0.181	6.8	A
		Exist + Dev		0.186	7.0	A
		Existing	PM	0.145	6.6	A
		Exist + Dev		0.147	8.0	A

* LoS of Priority Controlled Intersections based on worst performing movement.

It can be seen from Table 6 that the intersection of Lake Road and Hill Street maintains a LoS 'C' in the morning and evening peak periods under the existing plus development scenario. There is a negligible increase in average delay of 0.5 seconds in the morning peak and 0.7 seconds in the evening peak. The intersection will continue to operate with spare capacity.

The intersection of Lake Road and Savoy Street maintains a LoS 'C' in the morning and evening peak periods under the existing plus development scenario. There is a negligible increase in average delay of 0.6 seconds in the morning peak and 1.0 second in the evening peak. The intersection will continue to operate with spare capacity.

Finally, the intersection of Savoy Street and Parker Street maintains a LoS 'A' in the morning and evening peak periods under the existing plus development scenario. There is a negligible increase in average delay of 0.2 seconds in the morning peak and 1.4 seconds in the evening peak. The intersection will continue to operate with spare capacity.

In this regard, the impact of the development on the wider road network during the morning and evening network peak periods is considered acceptable with no external improvements required to support the development scheme.

6.6 Lake Road Driveway (Northern Driveway)

As can be seen from Table 4, the existing Lake Road access driveway will accommodate an additional 23 inbound vehicles per hour. These trips are distributed from the north and south, resulting in approximately 12 additional vehicles turning left and right into the driveway. These volumes equate to an additional vehicle every 150 seconds (2.6 mins). These volumes are not anticipated to cause any adverse impacts to the operation of the existing driveway which also accommodates a designated right-turn lane. Due to the modest increases in traffic, particularly right-turn movements, not further assessment (modelling etc.) is considered necessary.

7. SUSTAINABLE TRAVEL PLAN

7.1 Green Travel Plan

A comprehensive Green Travel Plan (GTP) can be developed for patients and staff of the development. This GTP is intended to encourage the use of public transport and alternative modes of transportation, with the primary objectives outlined as follows:

- Promote the use of sustainable transport methods, thus reducing congestion and pollution in the local area;
- Promote the private hospital as an innovative and environmentally aware organisation; and
- Provide an active environment by encouraging healthier travel options for patients and staff, such as walking and cycling.

A comprehensive GTP is considered to be an important part of managing the transport demand generated by the development. These plans would provide relevant transport and access information, including:

- Local bus facilities and network maps;
- Local railway and light rail stations; and
- Local walking and cycling routes.

Accordingly, the preparation of a GTP is encouraged to promote alternative modes of transport. Consequently, the travel targets in this case must be uniquely tailored to encourage alternative modes of transport and car-pool schemes.

In this regard, a formal carpool scheme for staff could be considered to reduce the impact of private vehicle usage. As an added incentive, on-site staff parking can be prioritised to vehicles transporting two (2) or more staff members to and from work. As such, the development of such a scheme would assist in actively reducing the reliance on private vehicle usage for staff of the development.

7.2 Travel Demand Management

It is envisaged that the reductions in car-based travel modes to achieve any future nominated targets could be facilitated by the following travel demand management measures, which are additional to the restricted parking supply policy that has been adopted:

- A Transport Access Guide (TAG) is considered to be a useful travel tool to encourage travel by alternative means other than private cars. This TAG would illustrate the public transport routes operating in the locality and is envisaged to be distributed for visitors and staff of the development; and
- Car sharing schemes can be encouraged for staff of the development. Initiatives could be implemented for staff whereby on-site parking spaces are prioritised for vehicles with two (2) or more staff members.

7.3 Travel Coordinator

This GTP would require the nomination of an individual or a team to maintain and oversee its implementation for visitors and staff of the development. The Travel Plan Coordinator will monitor and review the GTP, with the main roles outlined as follows:

- A monitoring and review process for the GTP;
- Updating the GTP to reflect the site operation and any changes to the public transport network;
- Re-examine the proposed targets to refine and update the proposed modal-split for visitors and staff travelling to and from the development.
- Undertake intermittent review of the success measures outlined in the plan to determine whether alternative or supplementary measures are necessary.

This evaluation will provide a reliable overview of the areas in which the GTP is operating effectively, and which areas require more attention in order to achieve the proposed long-term targets of the GTP.

8. ACCESS AND INTERNAL DESIGN ASPECTS

8.1 Site Vehicular Access

The development proposes a total of 144 car parking spaces from both Lake Road and Parker Street. As outlined in AS 2890.1 (2004), "when a car park has multiple access points, each access should be designed for the number of parking spaces effectively served by that access". 83 spaces are serviced via Lake Road and 61 spaces are serviced via Parker Street. As such, each access should be designed as a Category 2 access, with a combined entry/exit width of 6-9m.

In response, the development provides the following access arrangements, which are generally consistent with the existing arrangements:

- 6.0m wide 'Entry Only' driveway via Lake Road;
- 7.7m wide 'Exit Only' driveway via Lake Road;
- 5.6m wide 'Entry Only' driveway via Parker Street; and
- 6.4m wide 'Exit Only' driveway via Parker Street.

The above vehicle driveway provisions, including the separated entry/exit arrangements are considered supportable from a traffic engineering perspective and are compliant with the requirements of AS 2890.1 (2004).

8.2 Internal Design

The car park areas comply with the requirements of AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2022), with the following characteristics noteworthy:

8.2.1 Parking Modules

- All visitor car parking spaces have been designed in accordance with User Class 3 being for medical centre parking in accordance with AS 2890.1 (2004). These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.6m and a minimum aisle width of 5.8m.

- All staff parking spaces have been designed in accordance with User Class 1A being for employee parking in accordance with AS 2890.1 (2004). These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- All accessible parking spaces have been designed in accordance with AS 2890.6 (2009), being 2.4m wide, 5.4m long and situated immediately adjacent to a dedicated shared area or the circulating aisle.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS 2890.1 (2004).

8.2.2 Clear Head Heights

- A minimum clear head height of 2.2m is to be provided for all areas within car park as required by AS 2890.1 (2004).
- A minimum clear head height of 2.5m is to be provided above all accessible spaces and shared areas in accordance with AS 2890.6 (2022).

8.2.3 Loading

- The loading dock is designed to accommodate up to a 12.5m HRV, providing a minimum space width of 3.5m and a length of 12.5m in accordance with AS 2890.2 (2018).
- A minimum head height clearance of 4.5m is required above all areas traversed by the service vehicle (12.5m HRV) in accordance with AS 2890.2 (2018).
- The ambulance bays are designed to accommodate up to a 6.4m SRV, providing a space width of 3.5m and a length of 6.4m.
- A minimum head height clearance of 3.5m is required above all areas traversed by the ambulances.

8.2.4 Other Considerations

- All columns are located outside of the parking space design envelope shown in Figure 5.2 of AS 2890.1 (2004).

8.3 Summary

In summary, the internal configuration of the carpark has been designed in accordance with AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2022). It is however envisaged that a condition of consent could be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of any Construction Certificate.

9. CONCLUSIONS

The following Is noteworthy:

- The proposal seeks approval for the staged expansion of the existing Port Macquarie Private Hospital. The ultimate development stage proposes a total of 8 operating theatres, 5 consulting suites, 101 beds, 30 doctors on site at any one time and 150 staff on site at any one time. The proposal also includes the construction of a new car parking area and alterations to the existing parking area resulting in a total of 144 car parking spaces at Stage 2.
- The proposed development provides 144 parking spaces for Stage 2. This provision is considered acceptable in this circumstance for the reasons outlined in Section 5.1.
- The traffic generation arising from the development has been assessed as a net change over existing condition. SIDRA modelling demonstrates no change in the level of service at three (3) critical intersections during the morning and evening peak hours. As such, the traffic impacts of the proposal are considered acceptable with no external network improvements required to facilitate the proposal.
- Increases in traffic at the Lake Road entry driveway are modest and equate to an additional vehicle every 150 seconds. As such, the increase is not anticipated to have any adverse impacts to the driveway's operation.
- The car park has been assessed to comply with the requirements of AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2022), thereby ensuring safe and efficient operation.
- Waste collection and servicing for the private hospital is proposed to be undertaken on-site within the existing loading bay.
- Two (2) ambulance bays are provided on-site.

This traffic impact assessment therefore demonstrates that the subject application is supportable on traffic planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

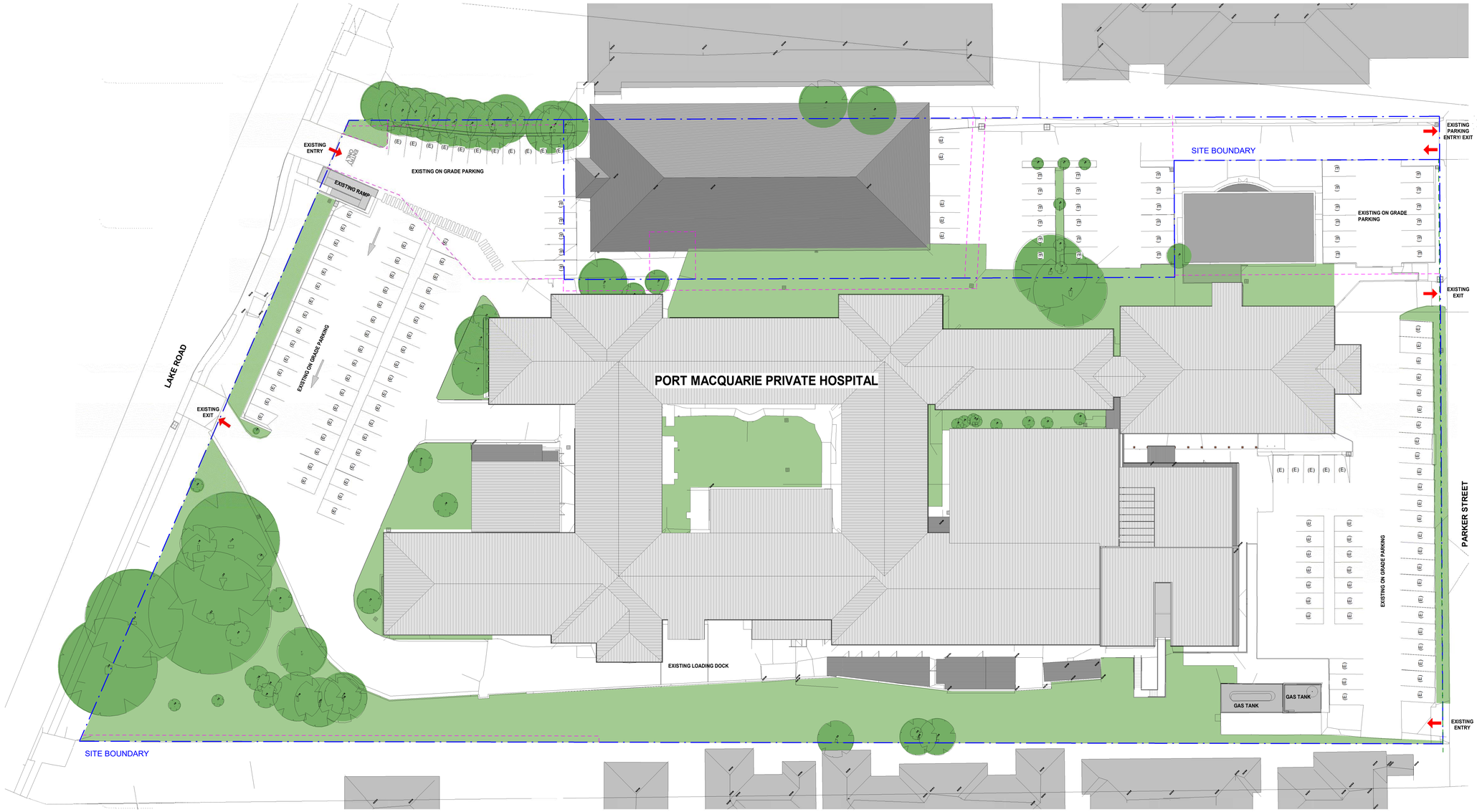
APPENDIX A

Reduced Plans

EXISTING	
SITE AREA:	17,329 sqm
GFA - GF:	5,320 sqm
FSR:	0.30:1
SITE PARKING:	126

LEGEND:

- EXISTING BUILDING
- BOUNDARY LINE
- EASEMENT LINE



ISSUED FOR DA

REV	DESCRIPTION	DATE	BY
6	CARPARK NUMBER UPDATED	23/06/23	NF
5	CARPARK NUMBER UPDATED AS PER DA COMMENTS	15/06/23	NF
4	DA COMMENTS UPDATE	24/05/23	NF
3	DA COMMENTS UPDATE	05/04/23	NF
2	COORDINATION UPDATES	15/09/22	NF
1	FIRST ISSUE	19/08/22	NF

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE. ALL DIMENSIONS SHALL BE VERIFIED ON SITE AND DISCREPANCIES IMMEDIATELY BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER FOR RESOLUTION

"CLOUDS" & REVISIONS ARE INTENDED AS GUIDES AND DO NOT NECESSARILY DESCRIBE THE FULL EXTENT OF REVISIONS. ASCERTAIN FULL EXTENT BY COMPARISON WITH PREVIOUS VERSION.

TRUE NORTH

QA CHECK

Subject	By	Date	Subject	By	Date	Subject	By	Date
RDS			STRUCT			PROJ. ARCH		
ARCH			SPEC. CONS					
AUT			SERV					

Project: **PORT MACQUARIE PRIVATE HOSPITAL**

Client: **RAMSAY HEALTH CARE**

Drawn: Author | Checked: Checker | Date: 06/16/22 | Scale/s: 1:300

Drawing Title: **SITE PLAN - EXISTING**

Health Projects International
Suite 301, Level 3, 52 Alfred Street South
Milsons Point NSW 2061 Tel: (02) 9460 4199
Nominated Architect: Chris Hayward Brown
(NSW 8250, TAS 1361, NT AR156, NZ 5357)
www.hpi.net.au ABN 33 066 856 595 ACN 066 856 595 © Copyright HPI

Project File | Dwg No: **PMP2-DA-SITE-E** | Issue: **6**

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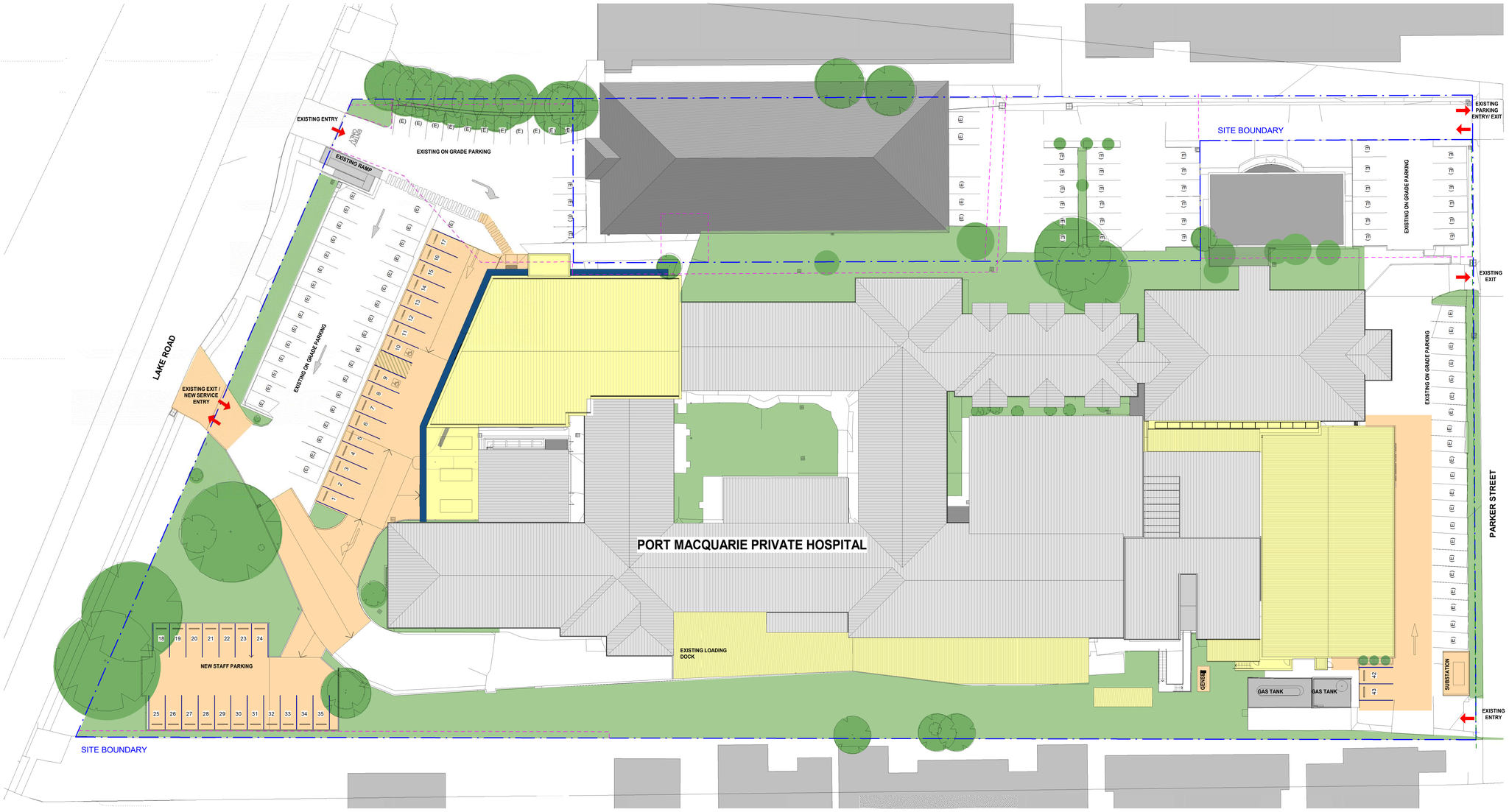
STAGE 1	
SITE AREA:	17,329 sqm
GFA - GF:	6,523 sqm
GFA - L1:	708 sqm
GFA - TOTAL:	7,231 sqm
FSR:	0.42:1
SITE PARKING:	125

LOCATION - STAGE 1

LEGEND:

- EXISITING BUILDING
- AREA OF PROPOSED WORKS
- AREA OF PROPOSED WORKS - EXTERNAL WORKS
- BOUNDARY LINE
- EASEMENT LINE
- AREA TO BE DEMOLISHED



ISSUED FOR DA

REV	DESCRIPTION	DATE	BY
6	CARPARK NUMBER UPDATED AND EXISTING TREE REMOVED	23/06/23	NF
5	CARPARK NUMBER UPDATED AS PER DA COMMENTS	15/06/23	NF
4	DA COMMENTS UPDATE	24/05/23	NF
3	DA COMMENTS UPDATE	05/04/23	NF
2	COORDINATION UPDATES	15/09/22	NF
1	FIRST ISSUE	02/09/22	NF

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TRUE NORTH

QA CHECK

Subject	By	Date	Subject	By	Date	Subject	By	Date
RDS			STRUCT			PROJ. ARCH		
ARCH			SPEC. CONS					
AUT			SERV					

Project: PORT MACQUARIE PRIVATE HOSPITAL

Client: RAMSAY HEALTH CARE

Drawing Title: SITE PLAN - PROPOSED - STAGE 1

Drawn	Checked	Date	Scale/s
Author	Checker	09/02/22	1:300

Health Projects International
Suite 301, Level 3, 52 Alfred Street South
Milsons Point NSW 2061 Tel: (02) 9460 4199
Nominated Architect: Chris Hayward Brown. (NSW 8250, TAS 1361, NT AR1156, NZ 5357)
www.hpi.net.au ABN 33 066 856 595 ACN 066 856 595 © Copyright HPI

Project File

Dwg No: PMP2-DA-SITE-ST1

Issue: 6

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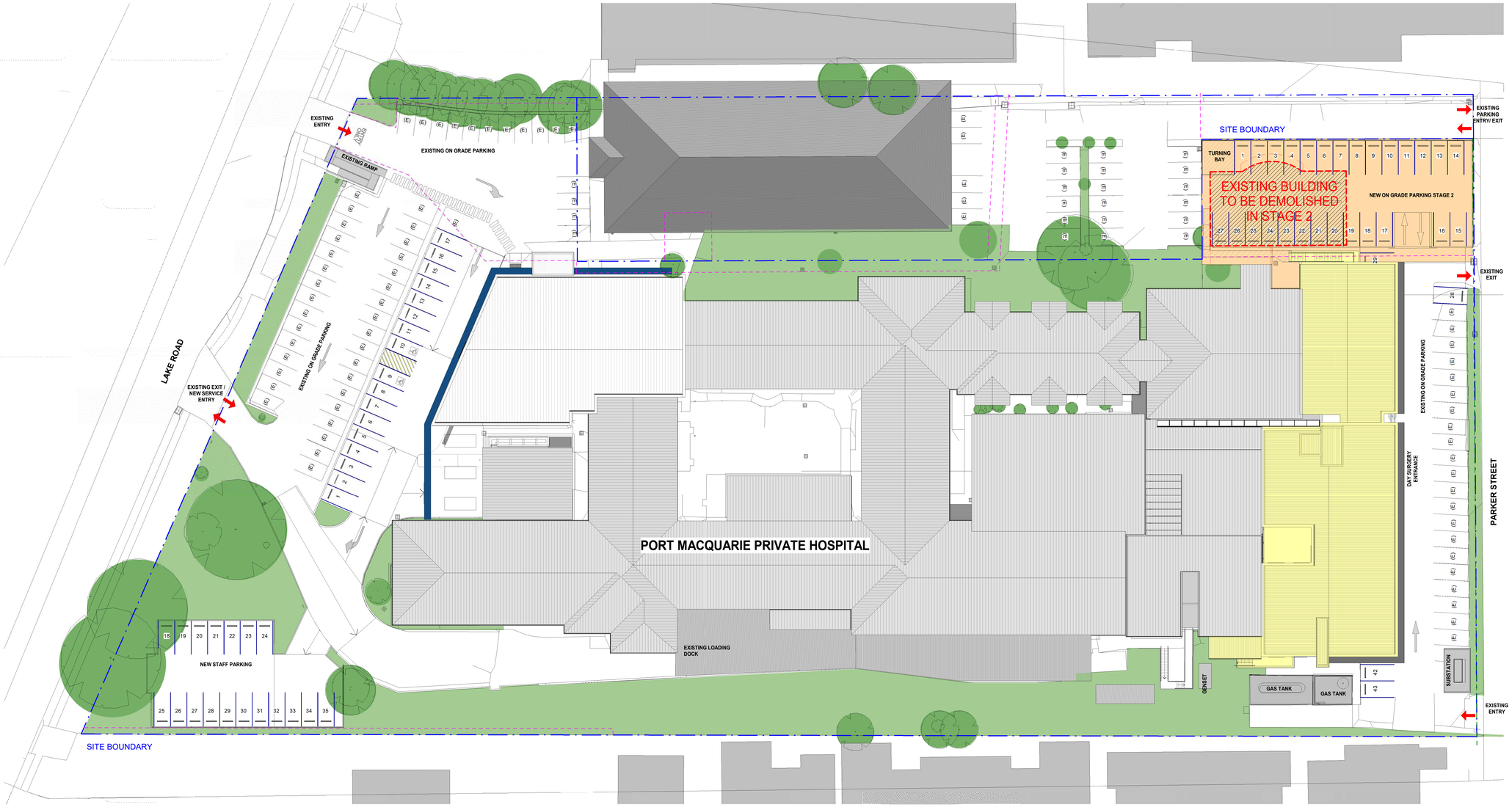
STAGE 2	
SITE AREA:	17,329 sqm
GFA - GF:	6,523 sqm
GFA - L1:	1,706 sqm
GFA - TOTAL	8,229 sqm
FSR:	0.47:1
SITE PARKING:	144

LOCATION - STAGE 2

LEGEND:

- EXISITING BUILDING
- AREA OF PROPOSED WORKS
- AREA OF PROPOSED WORKS - EXTERNAL WORKS
- BOUNDARY LINE
- EASEMENT LINE
- AREA TO BE DEMOLISHED



1 SITE PLAN - STAGE 2
SCALE 1 : 400

ISSUED FOR DA

REV	DESCRIPTION	DATE	BY
8	CARPARK NUMBER UPDATED AND EXISTING TREE REMOVED	23/06/23	NF
7	DA COMMENTS UPDATE	24/05/23	NF
6	DA COMMENTS UPDATE	05/04/23	NF
5	COORDINATION UPDATES	23/09/22	NF
4	COORDINATION UPDATES	15/09/22	NF
3	SERVICES COORDINATION UPDATES	02/09/22	NF
2	SECOND ISSUE	19/08/22	NF
1	FIRST ISSUE	08/08/22	RT

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"CLOUDS" & REVISIONS ARE INTENDED AS GUIDES AND DO NOT NECESSARILY DESCRIBE THE FULL EXTENT OF REVISIONS. ASCERTAIN FULL EXTENT BY COMPARISON WITH PREVIOUS VERSION.

TRUE NORTH

QA CHECK

Subject	By	Date	Subject	By	Date	Subject	By	Date
RDS			STRUCT			PROJ. ARCH		
ARCH			SPEC. CONS					
AUT			SERV					

Project: PORT MACQUARIE PRIVATE HOSPITAL

Client: RAMSAY HEALTH CARE

Drawing Title: SITE PLAN - PROPOSED - STAGE 2

Drawn	Checked	Date	Scale/s
RT	SG	16/05/22	1:300

Health Projects International
Suite 301, Level 3, 32 Alfred Street South
Milsons Point NSW 2061 Tel: (02) 9460 4199
Nominated Architect: Chris Hayward Brown
(NSW 8250, TAS 1361, NT AR156, NZ 5357)
www.hpi.net.au ABN 33 066 856 595 ACN 066 856 595 © Copyright HPI

Project File	Dwg.No.	Issue
	PMP2-DA-SITE-ST2	8

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APPENDIX B

SIDRA Outputs

USER REPORT FOR SITE

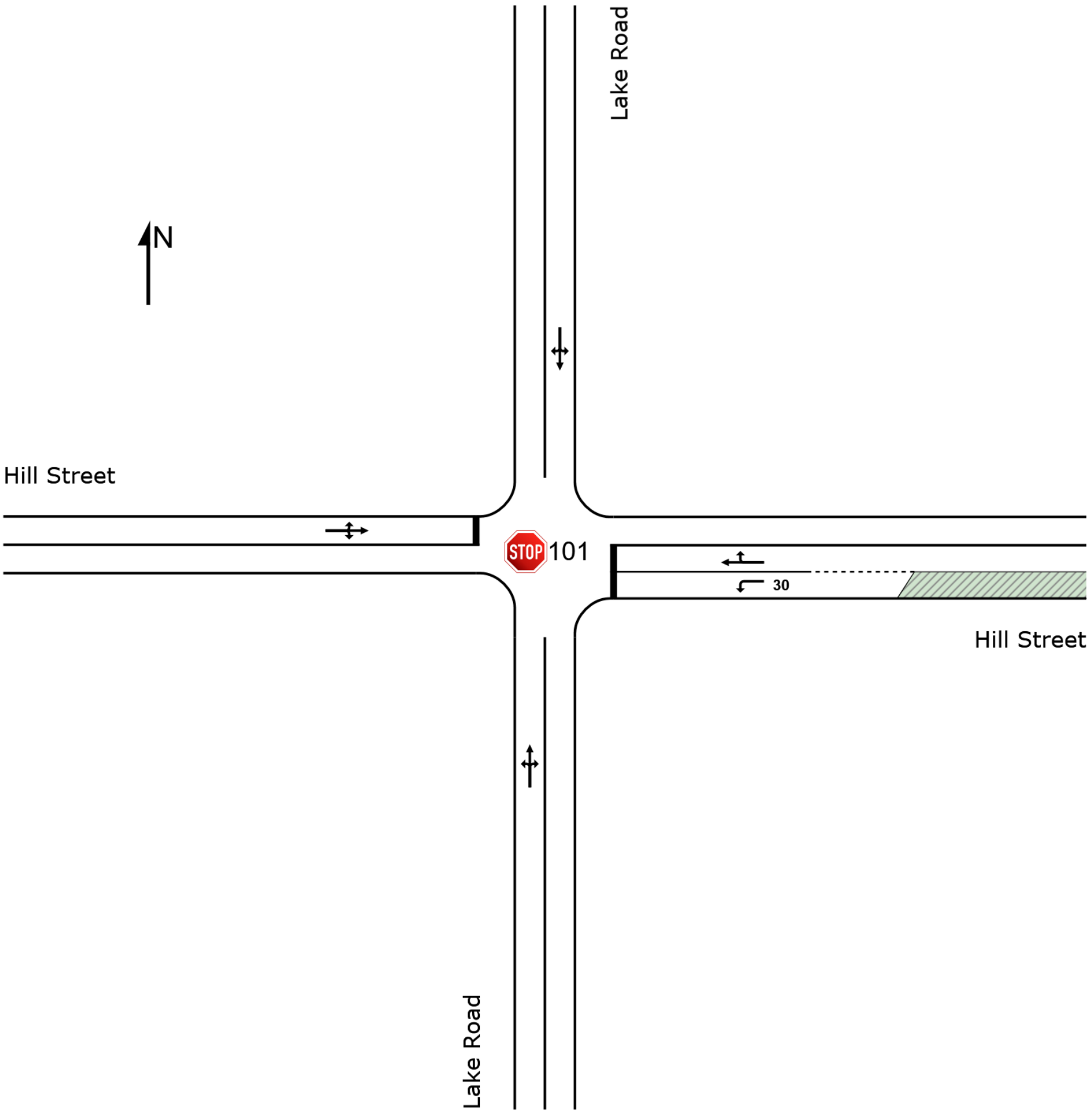
Project: 23.170m01v01 **Template: Default Site User Report**

Site: 101 [Existing Lake Road / Hill Street - AM (Site Folder: Existing)]

Existing Lake Road / Hill Street - AM
Site Category: (None)
Stop (Two-Way)

Site Layout

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



MOVEMENT SUMMARY

Site: 101 [Existing Lake Road / Hill Street - AM (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing Lake Road / Hill Street - AM
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lake Road															
1	L2	All MCs	6	0.0	6	0.0	0.348	3.4	LOS A	1.6	11.8	0.34	0.36	0.34	25.9
2	T1	All MCs	372	4.0	372	4.0	0.348	0.0	LOS A	1.6	11.8	0.34	0.36	0.34	39.4
3	R2	All MCs	195	2.7	195	2.7	0.348	6.6	LOS A	1.6	11.8	0.34	0.36	0.34	41.0
Approach			573	3.5	573	3.5	0.348	2.3	NA	1.6	11.8	0.34	0.36	0.34	39.7
East: Hill Street															
4	L2	All MCs	249	3.4	249	3.4	0.230	8.9	LOS A	1.0	7.3	0.40	0.88	0.40	39.9
5	T1	All MCs	2	0.0	2	0.0	0.164	15.2	LOS C	0.5	3.7	0.75	1.01	0.75	16.7
6	R2	All MCs	41	10.3	41	10.3	0.164	19.6	LOS C	0.5	3.7	0.75	1.01	0.75	36.4
Approach			293	4.3	293	4.3	0.230	10.5	LOS B	1.0	7.3	0.45	0.90	0.45	39.4
North: Lake Road															
7	L2	All MCs	54	5.9	54	5.9	0.165	3.4	LOS A	0.1	0.4	0.02	0.10	0.02	42.3
8	T1	All MCs	249	6.8	249	6.8	0.165	0.0	LOS A	0.1	0.4	0.02	0.10	0.02	39.8
9	R2	All MCs	4	0.0	4	0.0	0.165	7.6	LOS A	0.1	0.4	0.02	0.10	0.02	29.1
Approach			307	6.5	307	6.5	0.165	0.7	NA	0.1	0.4	0.02	0.10	0.02	40.0
West: Hill Street															
10	L2	All MCs	5	0.0	5	0.0	0.016	8.3	LOS A	0.1	0.4	0.56	0.86	0.56	34.9
11	T1	All MCs	2	0.0	2	0.0	0.016	14.1	LOS B	0.1	0.4	0.56	0.86	0.56	38.2
12	R2	All MCs	1	0.0	1	0.0	0.016	20.0	LOS C	0.1	0.4	0.56	0.86	0.56	36.9
Approach			8	0.0	8	0.0	0.016	11.2	LOS B	0.1	0.4	0.56	0.86	0.56	35.9
All Vehicles			1181	4.5	1181	4.5	0.348	4.0	NA	1.6	11.8	0.29	0.43	0.29	39.7

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

MOVEMENT SUMMARY

Site: 101 [Existing Lake Road / Hill Street - PM (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing Lake Road / Hill Street - AM
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lake Road															
1	L2	All MCs	7	0.0	7	0.0	0.331	3.5	LOS A	1.8	12.6	0.46	0.51	0.48	25.8
2	T1	All MCs	295	1.8	295	1.8	0.331	0.1	LOS A	1.8	12.6	0.46	0.51	0.48	39.2
3	R2	All MCs	181	1.2	181	1.2	0.331	9.1	LOS A	1.8	12.6	0.46	0.51	0.48	40.7
Approach			483	1.5	483	1.5	0.331	3.5	NA	1.8	12.6	0.46	0.51	0.48	39.5
East: Hill Street															
4	L2	All MCs	202	1.6	202	1.6	0.227	10.0	LOS A	0.9	6.7	0.51	0.92	0.51	39.7
5	T1	All MCs	1	0.0	1	0.0	0.124	16.1	LOS C	0.4	2.7	0.75	1.00	0.75	16.4
6	R2	All MCs	34	0.0	34	0.0	0.124	18.2	LOS C	0.4	2.7	0.75	1.00	0.75	36.7
Approach			237	1.3	237	1.3	0.227	11.2	LOS B	0.9	6.7	0.55	0.94	0.55	39.3
North: Lake Road															
7	L2	All MCs	87	0.0	87	0.0	0.268	3.4	LOS A	0.0	0.3	0.01	0.08	0.01	42.4
8	T1	All MCs	426	1.7	426	1.7	0.268	0.0	LOS A	0.0	0.3	0.01	0.08	0.01	39.9
9	R2	All MCs	3	0.0	3	0.0	0.268	4.7	LOS A	0.0	0.3	0.01	0.08	0.01	27.5
Approach			517	1.4	517	1.4	0.268	0.6	NA	0.0	0.3	0.01	0.08	0.01	40.1
West: Hill Street															
10	L2	All MCs	7	0.0	7	0.0	0.042	7.9	LOS A	0.1	0.9	0.63	0.89	0.63	33.8
11	T1	All MCs	2	0.0	2	0.0	0.042	15.9	LOS C	0.1	0.9	0.63	0.89	0.63	36.2
12	R2	All MCs	6	0.0	6	0.0	0.042	20.5	LOS C	0.1	0.9	0.63	0.89	0.63	36.2
Approach			16	0.0	16	0.0	0.042	14.0	LOS B	0.1	0.9	0.63	0.89	0.63	35.3
All Vehicles			1253	1.4	1253	1.4	0.331	3.9	NA	1.8	12.6	0.29	0.42	0.30	39.7

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

MOVEMENT SUMMARY

Site: 101 [Existing + Development Lake Road / Hill Street - AM (Site Folder: Existing Plus Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing + Development Lake Road / Hill Street - AM
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lake Road															
1	L2	All MCs	6	0.0	6	0.0	0.353	3.4	LOS A	1.7	12.0	0.35	0.36	0.35	26.0
2	T1	All MCs	378	3.9	378	3.9	0.353	0.0	LOS A	1.7	12.0	0.35	0.36	0.35	39.7
3	R2	All MCs	195	2.7	195	2.7	0.353	6.8	LOS A	1.7	12.0	0.35	0.36	0.35	41.1
Approach			579	3.5	579	3.5	0.353	2.3	NA	1.7	12.0	0.35	0.36	0.35	40.0
East: Hill Street															
4	L2	All MCs	249	3.4	249	3.4	0.233	9.0	LOS A	1.0	7.4	0.41	0.88	0.41	39.9
5	T1	All MCs	2	0.0	2	0.0	0.170	15.6	LOS C	0.5	3.9	0.76	1.01	0.77	16.6
6	R2	All MCs	41	10.3	41	10.3	0.170	20.3	LOS C	0.5	3.9	0.76	1.01	0.77	36.2
Approach			293	4.3	293	4.3	0.233	10.6	LOS B	1.0	7.4	0.47	0.90	0.47	39.4
North: Lake Road															
7	L2	All MCs	54	5.9	54	5.9	0.172	3.4	LOS A	0.1	0.4	0.02	0.10	0.02	42.8
8	T1	All MCs	262	6.4	262	6.4	0.172	0.0	LOS A	0.1	0.4	0.02	0.10	0.02	40.7
9	R2	All MCs	4	0.0	4	0.0	0.172	7.6	LOS A	0.1	0.4	0.02	0.10	0.02	29.5
Approach			320	6.3	320	6.3	0.172	0.7	NA	0.1	0.4	0.02	0.10	0.02	40.9
West: Hill Street															
10	L2	All MCs	5	0.0	5	0.0	0.016	8.3	LOS A	0.1	0.4	0.57	0.86	0.57	34.9
11	T1	All MCs	2	0.0	2	0.0	0.016	14.5	LOS B	0.1	0.4	0.57	0.86	0.57	38.1
12	R2	All MCs	1	0.0	1	0.0	0.016	20.5	LOS C	0.1	0.4	0.57	0.86	0.57	36.9
Approach			8	0.0	8	0.0	0.016	11.4	LOS B	0.1	0.4	0.57	0.86	0.57	35.8
All Vehicles			1200	4.4	1200	4.4	0.353	4.0	NA	1.7	12.0	0.29	0.43	0.29	40.1

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

MOVEMENT SUMMARY

Site: 101 [Existing + Development Lake Road / Hill Street - PM (Site Folder: Existing Plus Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing + Development Lake Road / Hill Street - PM
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lake Road															
1	L2	All MCs	7	0.0	7	0.0	0.340	3.5	LOS A	1.9	13.3	0.46	0.51	0.49	26.0
2	T1	All MCs	309	1.7	309	1.7	0.340	0.1	LOS A	1.9	13.3	0.46	0.51	0.49	39.9
3	R2	All MCs	181	1.2	181	1.2	0.340	9.4	LOS A	1.9	13.3	0.46	0.51	0.49	41.2
Approach			498	1.5	498	1.5	0.340	3.5	NA	1.9	13.3	0.46	0.51	0.49	40.1
East: Hill Street															
4	L2	All MCs	202	1.6	202	1.6	0.229	10.0	LOS B	1.0	6.7	0.52	0.93	0.52	39.7
5	T1	All MCs	1	0.0	1	0.0	0.129	16.6	LOS C	0.4	2.8	0.77	1.00	0.77	16.3
6	R2	All MCs	34	0.0	34	0.0	0.129	18.8	LOS C	0.4	2.8	0.77	1.00	0.77	36.6
Approach			237	1.3	237	1.3	0.229	11.3	LOS B	1.0	6.7	0.55	0.94	0.55	39.3
North: Lake Road															
7	L2	All MCs	87	0.0	87	0.0	0.272	3.4	LOS A	0.0	0.3	0.01	0.08	0.01	42.6
8	T1	All MCs	435	1.7	435	1.7	0.272	0.0	LOS A	0.0	0.3	0.01	0.08	0.01	40.2
9	R2	All MCs	3	0.0	3	0.0	0.272	4.8	LOS A	0.0	0.3	0.01	0.08	0.01	27.6
Approach			525	1.4	525	1.4	0.272	0.6	NA	0.0	0.3	0.01	0.08	0.01	40.4
West: Hill Street															
10	L2	All MCs	7	0.0	7	0.0	0.043	8.0	LOS A	0.1	1.0	0.64	0.89	0.64	33.6
11	T1	All MCs	2	0.0	2	0.0	0.043	16.4	LOS C	0.1	1.0	0.64	0.89	0.64	36.0
12	R2	All MCs	6	0.0	6	0.0	0.043	21.2	LOS C	0.1	1.0	0.64	0.89	0.64	36.1
Approach			16	0.0	16	0.0	0.043	14.4	LOS B	0.1	1.0	0.64	0.89	0.64	35.1
All Vehicles			1276	1.4	1276	1.4	0.340	3.9	NA	1.9	13.3	0.30	0.42	0.31	40.1

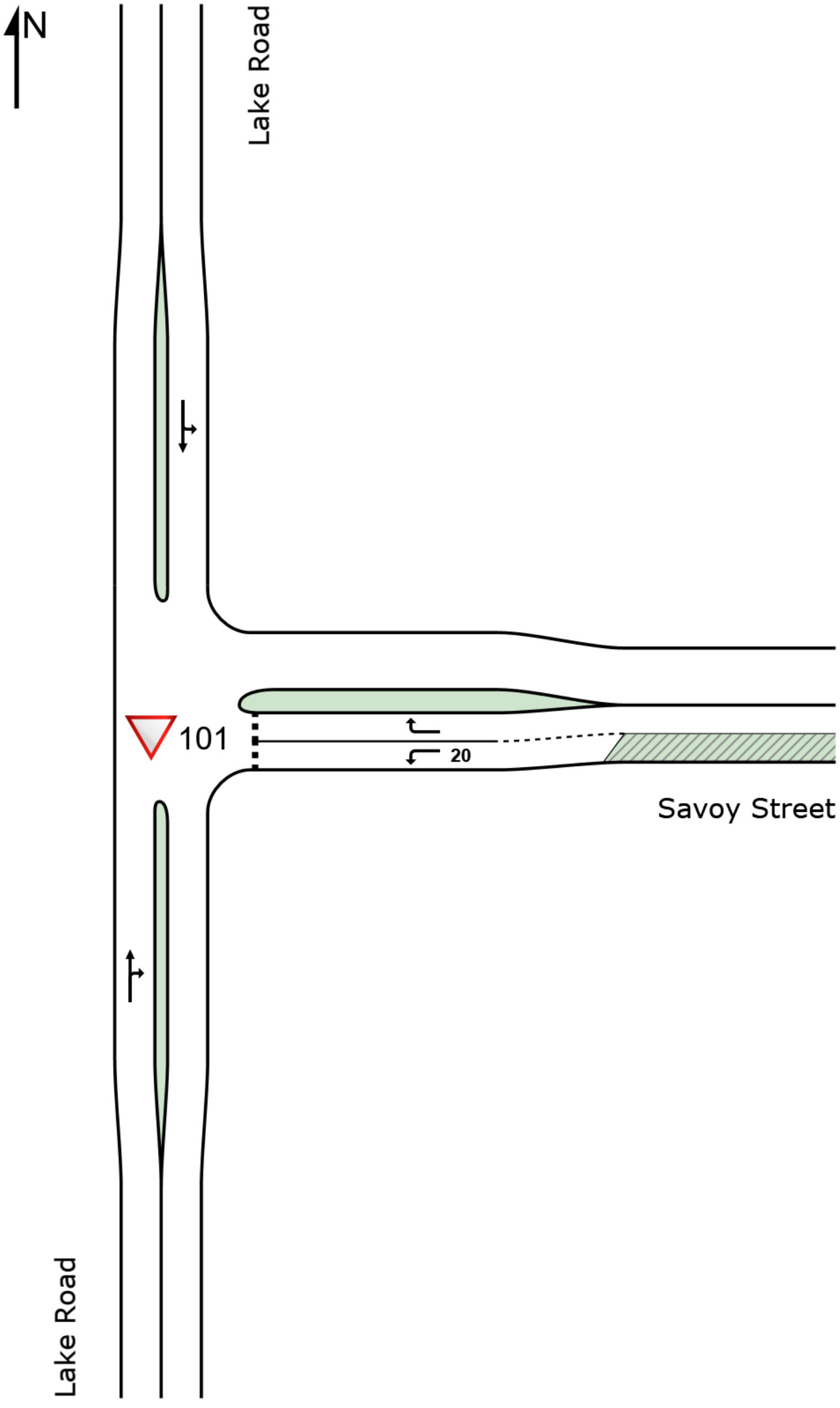
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of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

Site: 101 [Existing Lake Road / Savoy Street - AM (Site Folder: Existing)]

Existing Lake Road / Savoy Street - AM
Site Category: (None)
Give-Way (Two-Way)

Site Layout

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



MOVEMENT SUMMARY

Site: 101 [Existing Lake Road / Savoy Street - AM (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing Lake Road / Savoy Street - AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lake Road															
2	T1	All MCs	546	2.5	546	2.5	0.402	1.4	LOS A	1.7	12.2	0.28	0.44	0.31	42.9
3	R2	All MCs	135	3.1	135	3.1	0.402	10.7	LOS B	1.7	12.2	0.28	0.44	0.31	47.8
Approach			681	2.6	681	2.6	0.402	3.3	NA	1.7	12.2	0.28	0.44	0.31	43.6
East: Savoy Street															
4	L2	All MCs	324	1.6	324	1.6	0.298	6.6	LOS A	1.4	9.6	0.50	0.68	0.51	46.4
6	R2	All MCs	34	15.6	34	15.6	0.130	16.9	LOS C	0.4	2.8	0.78	0.90	0.78	38.7
Approach			358	2.9	358	2.9	0.298	7.5	LOS A	1.4	9.6	0.53	0.70	0.54	45.4
North: Lake Road															
7	L2	All MCs	38	16.7	38	16.7	0.231	3.7	LOS A	0.0	0.0	0.00	0.04	0.00	39.6
8	T1	All MCs	407	3.6	407	3.6	0.231	0.2	LOS A	0.0	0.0	0.00	0.04	0.00	39.9
Approach			445	4.7	445	4.7	0.231	0.5	NA	0.0	0.0	0.00	0.04	0.00	39.9
All Vehicles			1484	3.3	1484	3.3	0.402	3.5	NA	1.7	12.2	0.26	0.38	0.27	42.6

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

MOVEMENT SUMMARY

Site: 101 [Existing Lake Road / Savoy Street - PM (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing Lake Road / Savoy Street - AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lake Road															
2	T1	All MCs	434	0.5	434	0.5	0.533	3.2	LOS A	5.4	37.9	0.57	0.78	1.01	41.8
3	R2	All MCs	258	1.2	258	1.2	0.533	16.3	LOS C	5.4	37.9	0.57	0.78	1.01	45.9
Approach			692	0.8	692	0.8	0.533	8.1	NA	5.4	37.9	0.57	0.78	1.01	42.9
East: Savoy Street															
4	L2	All MCs	195	0.5	195	0.5	0.230	7.7	LOS A	0.9	6.4	0.58	0.77	0.58	46.0
6	R2	All MCs	31	10.3	31	10.3	0.155	21.4	LOS C	0.4	3.1	0.84	0.93	0.86	37.7
Approach			225	1.9	225	1.9	0.230	9.6	LOS A	0.9	6.4	0.61	0.79	0.61	44.5
North: Lake Road															
7	L2	All MCs	57	7.4	57	7.4	0.343	3.8	LOS A	0.0	0.0	0.00	0.04	0.00	39.6
8	T1	All MCs	620	0.8	620	0.8	0.343	0.3	LOS A	0.0	0.0	0.00	0.04	0.00	39.8
Approach			677	1.4	677	1.4	0.343	0.6	NA	0.0	0.0	0.00	0.04	0.00	39.8
All Vehicles			1594	1.2	1594	1.2	0.533	5.1	NA	5.4	37.9	0.34	0.47	0.52	41.6

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

MOVEMENT SUMMARY

Site: 101 [Existing + Development Lake Road / Savoy Street - AM (Site Folder: Existing Plus Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing + Development Lake Road / Savoy Street - AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lake Road															
2	T1	All MCs	558	2.5	558	2.5	0.414	1.4	LOS A	1.9	13.5	0.29	0.45	0.33	43.2
3	R2	All MCs	141	3.0	141	3.0	0.414	10.9	LOS B	1.9	13.5	0.29	0.45	0.33	48.1
Approach			699	2.6	699	2.6	0.414	3.4	NA	1.9	13.5	0.29	0.45	0.33	43.9
East: Savoy Street															
4	L2	All MCs	326	1.6	326	1.6	0.302	6.6	LOS A	1.4	9.9	0.51	0.68	0.52	46.5
6	R2	All MCs	35	15.2	35	15.2	0.139	17.5	LOS C	0.4	3.0	0.79	0.90	0.79	39.0
Approach			361	2.9	361	2.9	0.302	7.7	LOS A	1.4	9.9	0.54	0.70	0.55	45.5
North: Lake Road															
7	L2	All MCs	38	16.7	38	16.7	0.233	3.7	LOS A	0.0	0.0	0.00	0.04	0.00	39.7
8	T1	All MCs	413	3.6	413	3.6	0.233	0.2	LOS A	0.0	0.0	0.00	0.04	0.00	40.0
Approach			451	4.7	451	4.7	0.233	0.5	NA	0.0	0.0	0.00	0.04	0.00	40.0
All Vehicles			1511	3.3	1511	3.3	0.414	3.5	NA	1.9	13.5	0.26	0.39	0.29	42.9

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

MOVEMENT SUMMARY

Site: 101 [Existing + Development Lake Road / Savoy Street - PM (Site Folder: Existing Plus Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing + Development Lake Road / Savoy Street - PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lake Road															
2	T1	All MCs	441	0.5	441	0.5	0.547	3.4	LOS A	5.7	40.4	0.59	0.79	1.06	41.9
3	R2	All MCs	262	1.2	262	1.2	0.547	16.9	LOS C	5.7	40.4	0.59	0.79	1.06	45.9
Approach			703	0.7	703	0.7	0.547	8.5	NA	5.7	40.4	0.59	0.79	1.06	43.1
East: Savoy Street															
4	L2	All MCs	198	0.5	198	0.5	0.238	7.9	LOS A	1.0	6.7	0.58	0.78	0.60	46.1
6	R2	All MCs	34	9.4	34	9.4	0.176	22.4	LOS C	0.5	3.5	0.85	0.94	0.89	38.7
Approach			232	1.8	232	1.8	0.238	10.0	LOS A	1.0	6.7	0.62	0.81	0.64	44.6
North: Lake Road															
7	L2	All MCs	57	7.4	57	7.4	0.349	3.8	LOS A	0.0	0.0	0.00	0.04	0.00	39.8
8	T1	All MCs	633	0.8	633	0.8	0.349	0.3	LOS A	0.0	0.0	0.00	0.04	0.00	40.1
Approach			689	1.4	689	1.4	0.349	0.6	NA	0.0	0.0	0.00	0.04	0.00	40.0
All Vehicles			1624	1.2	1624	1.2	0.547	5.4	NA	5.7	40.4	0.34	0.47	0.55	41.8

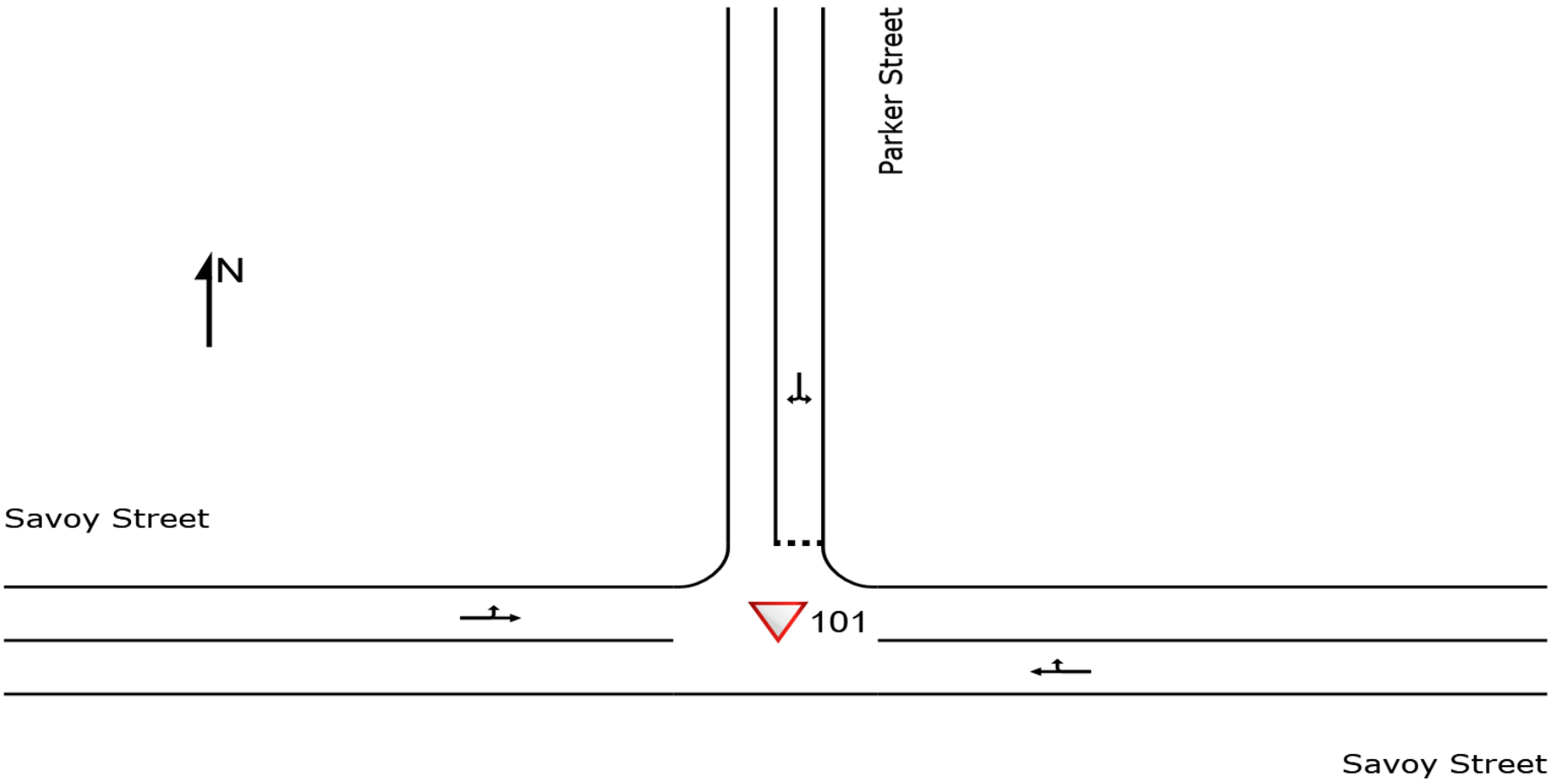
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of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

Site: 101 [Existing Savoy Street / Parker Street - AM (Site Folder: Existing)]

Existing Savoy Street / Parker Street - AM
Site Category: (None)
Give-Way (Two-Way)

Site Layout

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



MOVEMENT SUMMARY

Site: 101 [Existing Savoy Street / Parker Street - AM (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing Savoy Street / Parker Street - AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Savoy Street															
5	T1	All MCs	352	2.1	352	2.1	0.181	0.0	LOS A	0.2	1.1	0.04	0.04	0.04	49.6
6	R2	All MCs	20	0.0	20	0.0	0.181	5.8	LOS A	0.2	1.1	0.04	0.04	0.04	47.4
Approach			372	2.0	372	2.0	0.181	0.3	NA	0.2	1.1	0.04	0.04	0.04	49.4
North: Parker Street															
7	L2	All MCs	5	0.0	5	0.0	0.025	4.9	LOS A	0.1	0.6	0.37	0.56	0.37	41.9
9	R2	All MCs	17	0.0	17	0.0	0.025	6.8	LOS A	0.1	0.6	0.37	0.56	0.37	40.6
Approach			22	0.0	22	0.0	0.025	6.3	LOS A	0.1	0.6	0.37	0.56	0.37	40.9
West: Savoy Street															
10	L2	All MCs	35	3.0	35	3.0	0.078	4.6	LOS A	0.0	0.0	0.00	0.12	0.00	46.1
11	T1	All MCs	123	7.7	123	7.7	0.078	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	48.9
Approach			158	6.7	158	6.7	0.078	1.0	NA	0.0	0.0	0.00	0.12	0.00	48.4
All Vehicles			552	3.2	552	3.2	0.181	0.8	NA	0.2	1.1	0.04	0.09	0.04	48.8

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

MOVEMENT SUMMARY

Site: 101 [Existing Savoy Street / Parker Street - PM (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing Savoy Street / Parker Street - AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Savoy Street															
5	T1	All MCs	169	2.5	169	2.5	0.083	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	49.9
6	R2	All MCs	2	0.0	2	0.0	0.083	5.6	LOS A	0.0	0.1	0.01	0.01	0.01	47.7
Approach			172	2.5	172	2.5	0.083	0.1	NA	0.0	0.1	0.01	0.01	0.01	49.9
North: Parker Street															
7	L2	All MCs	21	0.0	21	0.0	0.061	5.5	LOS A	0.2	1.5	0.40	0.61	0.40	42.0
9	R2	All MCs	37	0.0	37	0.0	0.061	6.6	LOS A	0.2	1.5	0.40	0.61	0.40	40.8
Approach			58	0.0	58	0.0	0.061	6.2	LOS A	0.2	1.5	0.40	0.61	0.40	41.2
West: Savoy Street															
10	L2	All MCs	15	0.0	15	0.0	0.145	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	47.2
11	T1	All MCs	289	1.1	289	1.1	0.145	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
Approach			304	1.0	304	1.0	0.145	0.2	NA	0.0	0.0	0.00	0.03	0.00	49.6
All Vehicles			534	1.4	534	1.4	0.145	0.8	NA	0.2	1.5	0.05	0.08	0.05	48.8

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

MOVEMENT SUMMARY

Site: 101 [Existing + Development Savoy Street / Parker Street - AM (Site Folder: Existing Plus Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing + Development Savoy Street / Parker Street - AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Savoy Street															
5	T1	All MCs	352	2.1	352	2.1	0.186	0.0	LOS A	0.2	1.5	0.06	0.06	0.06	49.5
6	R2	All MCs	27	0.0	27	0.0	0.186	6.3	LOS A	0.2	1.5	0.06	0.06	0.06	47.9
Approach			379	1.9	379	1.9	0.186	0.5	NA	0.2	1.5	0.06	0.06	0.06	49.4
North: Parker Street															
7	L2	All MCs	8	0.0	8	0.0	0.032	5.3	LOS A	0.1	0.7	0.36	0.57	0.36	43.6
9	R2	All MCs	20	0.0	20	0.0	0.032	7.0	LOS A	0.1	0.7	0.36	0.57	0.36	41.5
Approach			28	0.0	28	0.0	0.032	6.5	LOS A	0.1	0.7	0.36	0.57	0.36	42.2
West: Savoy Street															
10	L2	All MCs	41	2.6	41	2.6	0.082	4.6	LOS A	0.0	0.0	0.00	0.14	0.00	46.2
11	T1	All MCs	123	7.7	123	7.7	0.082	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	49.0
Approach			164	6.4	164	6.4	0.082	1.2	NA	0.0	0.0	0.00	0.14	0.00	48.4
All Vehicles			572	3.1	572	3.1	0.186	1.0	NA	0.2	1.5	0.05	0.11	0.05	48.8

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

MOVEMENT SUMMARY

Site: 101 [Existing + Development Savoy Street / Parker Street - PM (Site Folder: Existing Plus Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Existing + Development Savoy Street / Parker Street - PM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Savoy Street															
5	T1	All MCs	169	2.5	169	2.5	0.087	0.0	LOS A	0.1	0.4	0.04	0.05	0.04	49.7
6	R2	All MCs	7	0.0	7	0.0	0.087	8.0	LOS A	0.1	0.4	0.04	0.05	0.04	48.9
Approach			177	2.4	177	2.4	0.087	0.3	NA	0.1	0.4	0.04	0.05	0.04	49.7
North: Parker Street															
7	L2	All MCs	28	0.0	28	0.0	0.075	5.8	LOS A	0.3	1.8	0.40	0.63	0.40	43.2
9	R2	All MCs	43	0.0	43	0.0	0.075	6.8	LOS A	0.3	1.8	0.40	0.63	0.40	41.5
Approach			72	0.0	72	0.0	0.075	6.4	LOS A	0.3	1.8	0.40	0.63	0.40	42.3
West: Savoy Street															
10	L2	All MCs	19	0.0	19	0.0	0.147	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	47.2
11	T1	All MCs	289	1.1	289	1.1	0.147	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.8
Approach			308	1.0	308	1.0	0.147	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.6
All Vehicles			557	1.3	557	1.3	0.147	1.1	NA	0.3	1.8	0.07	0.12	0.07	48.7

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