TRAFFIC & PARKING ASSESSMENT

CHARLESTOWN PRIVATE HOSPITAL

LOTS 1 & 2 DP 877977
33 SMITH STREET, CHARLESTOWN

PREPARED FOR: ARCHADIA PROJECTS PTY LTD

AMENDED APRIL 2023

22/028

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ARCHADIA PROJECTS PTY LTD

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Issue	Date	Description	By
A	29/04/22	Draft	JG
B	13/05/22	Edit	JG
C	26/08/22	Proof / Amended Plans	JG
D	26/08/22	Approved	JG
E	20/09/22	Client amendments / Approved	JG
F	16/11/22	Amended Plans / Approved	JG
G	19/04/23	TfNSW comments / Approved	JG
H	22/04/23	SIDRA amendment / Approved	JG

This document has been authorised by

Date 22nd April 2023

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1.0 INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by Archadia Projects Pty Ltd to prepare a traffic and parking assessment report for a proposed private hospital on Lots 1 & 2 DP 877977 – 33 Smith Street, Charlestown. A new vehicular access to the site off Frederick Street is proposed to a small ground level servicing and patient drop off areas while a new vehicular access off Smith Street is proposed to a multi-level car park (3 levels) both of which are combined entry / exit accesses. The car park layout provides excellent circulation ensuring convenient manoeuvrability through the site and forward entry and exit from the site. The development concept plans are shown in ***Attachment A***.

This report is required to support a development application to Lake Macquarie City Council and allow the Council to assess the proposal in respect of its impact on the local and state road network.

This report presents the findings of the traffic and parking assessment and includes the following.

1. An outline of the existing situation near the site.
2. An assessment of the traffic impacts of the proposed development including the predicted traffic generation and its impact on existing road and intersection capacities.
3. Reviews parking, public transport, pedestrian, and cycle way requirements for the proposed development, including assessment against Council, Australian Standards and the NSW Roads and Maritime Services (RMS) standards as required.
4. Presentation of conclusions and recommendations.

2.0 SITE DESCRIPTION

The subject site is shown in ***Figure 1*** below. It is located on the northern side of Frederick Street, Charlestown between the Pacific Highway and Smith Street at the southern end of the Charlestown CBD.

The part of the site to be utilised by the private hospital has an area of approximately 8,300 m^2 and is addressed as 33 Smith Street, Charlestown. The site is currently vacant but previously contained a public primary school. All buildings and structures that were on the site as part of its previous use have been demolished and removed from the site. Pursuant to the Lake Macquarie City Council LEP (2014) it is zoned as B3 – Commercial Core and B4 – Mixed Use.

The site has frontage to the Pacific Highway, Frederick Street and Smith Street, while a one-way service laneway runs along part of the northern frontage of the site to Smith Street with this laneway being accessed from the vehicular access to McDonald's Charlestown. It currently has residential standard vehicular access crossings off both Frederick Street and Smith Street (3 off). ***Photograph 1*** shows the existing development on the site and ***Photographs 2, 3 & 4*** show the existing vehicular accesses to the site.

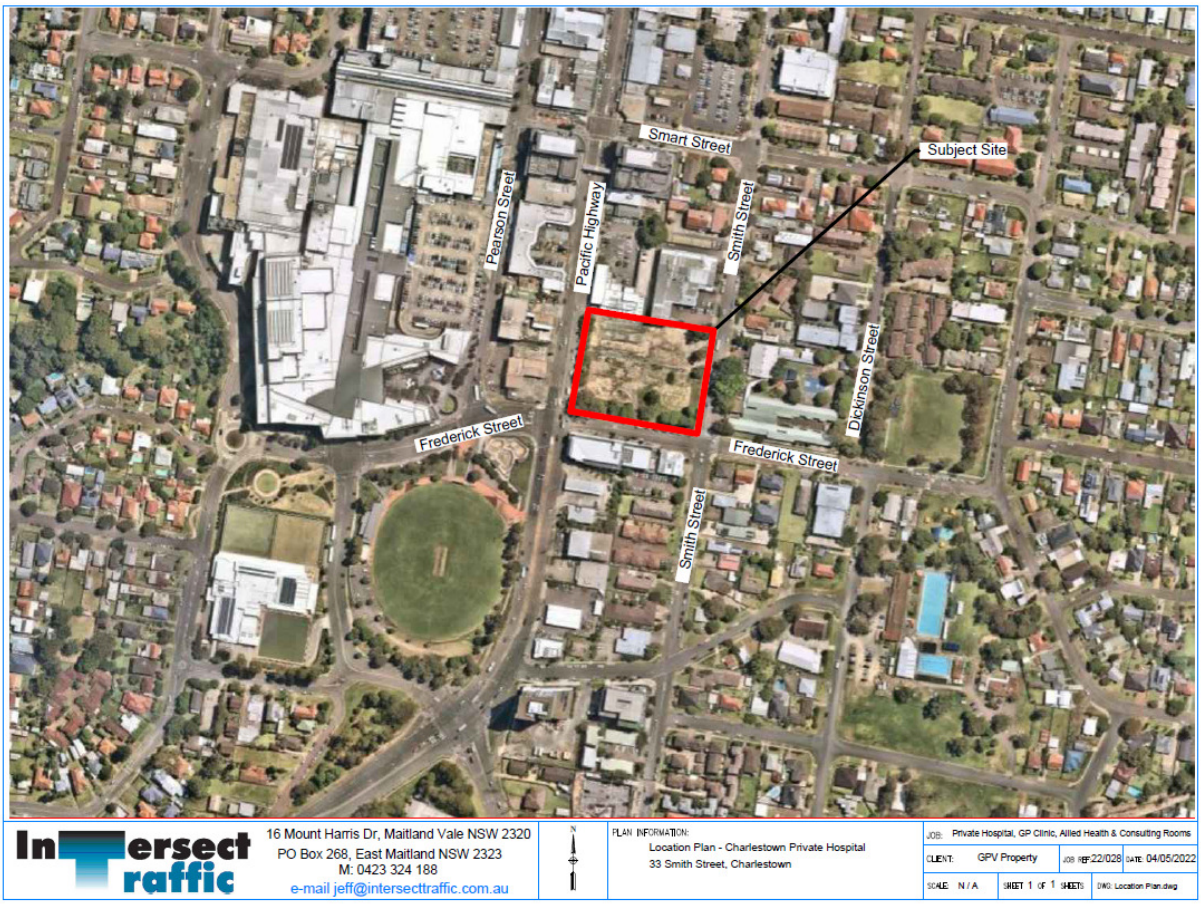


Figure 1 – Site Location

Photograph 1 – Development site from Frederick Street.

Photograph 2 – Existing vehicular access –Frederick Street

Photograph 3 – Existing southern vehicular access – Smith Street

Photograph 4 – Existing northern vehicular access – Smith Street

3.0 EXISTING ROAD NETWORK

3.1 Pacific Highway

The Pacific Highway is a major transport road collecting and distributing traffic to and from areas north and south of the development site. It serves as an arterial road under a functional road hierarchy continuing as State Highway 10 through Lake Macquarie and to the Central Coast and Newcastle and further north or south. It connects to the M1 Motorway via many link roads. The Pacific Highway is under the care and control of Transport for NSW (TfNSW).

Adjacent to the site, the Pacific Highway is a six-lane two-way sealed divided road except were widened at intersections. The travel lanes are 3.0 metres wide while the kerbside lanes are used for on-street car parking and are 2.3 to 3 metres wide. The north and southbound travel lanes are separated by a concrete median island with pedestrian fence and the carriageway has kerb and gutter and drainage on both sides. The Pacific Highway has a 60 km/h speed zoning near the site and at the time of inspection the Pacific Highway was in good condition. ***Photograph 5*** shows the Pacific Highway adjacent to the site.

Photograph 5 – Pacific Highway adjacent to the site.

3.2 Frederick Street

Under a functional road hierarchy Frederick Street would be considered a local urban collector street with its primary function to collect and distribute traffic from Charlestown east to the arterial road network at the Pacific Highway. However, it also provides vehicular access to properties along its length. It is under the care and control of Lake Macquarie City Council. Near the site it is

a two-lane two-way sealed road with parking lanes on both sides of the road. On-street parking in the street is generally limited to 2-hour periods during normal CBD business hours. The carriageway width is approximately 12 metres, allowing travel lanes of in excess of 3 metres wide and a 50 km/h speed limit apply to this section of road. At the time of inspection Frederick Street was observed to be in good condition. ***Photograph 6*** shows Frederick Street near the site.

Photograph 6 – Frederick Street near the site.

3.3 Smith Street

Smith Street under a functional road hierarchy would be considered a local collector Street near the site. It connects to the Pacific Highway 290 metres north of the site and to Frederick Street south of the site. As a local collector road, it is under the care and control of Lake Macquarie City Council. Smith Street is a two lane two way sealed urban road with kerb and gutter along both sides of the road and a carriageway width of approximately 13 metres, allowing two travel lanes (one in each direction) and on-street parking lanes on both sides of the road. A 50 km/h speed limit applies to this section of road and at the time of inspection Smith Street was observed to be in good condition. ***Photograph 7*** shows Smith Street adjacent to the site.

4.0 ROAD NETWORK IMPROVEMENTS

There are no known major road upgrades in the vicinity of the site that will improve the capacity of the local road network in the near future. Maintenance works would be carried out on the local road network in line with both Lake Macquarie City Council and TfNSW annual works programs.

Photograph 7 – Smith Street adjacent to the site.

5.0 TRAFFIC VOLUMES

Northern Transport Planning and Engineering (NTPE) on behalf of Intersect Traffic undertook manual intersection counts at the following intersections on Monday 14th March 2002 (PM peak period) and Tuesday 15th March 2022 (AM peak period).

- Pacific Highway / Frederick Street; and
- Frederick Street / Smith Street.

Whilst primarily undertaken to allow the intersections to be modelled for future traffic conditions these counts also provide a guide to the current mid-block traffic volumes on the local road network. The tally sheets for these counts are provided in ***Attachment B***. The peak traffic periods were found to be 7.45 am to 9 am and 3 pm to 5.30 pm.

Based on the data collected the current two-way mid-block two-way traffic volumes on the road network around the development site which have been adopted for this assessment are as shown in ***Table 1*** below. The predicted 2032 two-way mid-block traffic volumes are also shown in ***Table 1*** and have been calculated using a 1.5% p.a. background traffic growth.

Table 1 – Existing and future two-way mid-block road network traffic volumes.

Road	Section	2022		2032 @ 1.5% p.a.	
		AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)
Pacific Highway	north of Frederick Street	2599	2474	3016	2871
Pacific Highway	south of Frederick Street	2440	2386	2832	2769
Frederick Street	east of Pacific Highway	422	455	490	528
Frederick Street	west of Pacific Highway	244	523	283	607
Frederick Street	east of Smith Street	379	346	440	402
Smith Street	north of Frederick Street	434	338	504	392
Smith Street	south of Frederick Street	295	254	342	295

6.0 ROAD CAPACITY

The capacity of urban roads is generally determined by the capacity of intersections. However, Tables 4.3 and 4.4 of the RTA's *Guide to Traffic Generating Developments* provides some guidance on mid block capacities for urban roads and likely levels of service. These tables are reproduced below.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Source: - RTA's Guide to Traffic Generating Developments (2002).

Noting the Pacific Highway as generally a 4-lane divided road and ignoring the parking lanes the table above indicates a one-way mid-block capacity of 1,900 vtph for the Highway therefore a two-way mid-block capacity of 3,800 vtph would apply to the Highway at a LoS C. However, as an arterial road it would still be acceptable to have a LoS D operating on the road with single lane capacities up to 1,100 vtph. On this basis the adopted two-way mid-block road capacity is based on a LoS D operating and is considered to be in the order of 4,400 vtph.

Smith Street and Frederick Street being two lane two-way local roads with parking lanes and for which a LoS C is considered an appropriate capacity goal would have a one-way mid-block lane capacity of 900 vtph and a two-way mid-block capacity of 1,800 vtph. As both roads service commercial developments within the Charlestown DCP the environmental capacity goals of the roads is not considered relevant in this assessment. Therefore, the two-way mid-block road capacities adopted in this assessment are as follows.

- Pacific Highway – 4,400 vtph; and
- Frederick Street and Smith Street – 1, 800 vtph.

7.0 ALTERNATE TRANSPORT MODES

Keolis Downer Hunter run public transport (bus) services for TfNSW in the area. A review of the routes map and timetables for the service indicates that bus services run along Smith Street past the site. An extract of the bus routes map near the site is shown in ***Figure 2*** below.

Bus route 48 (Belmont – - North Belmont - Redhead – Charlestown) runs directly past the site on Smith Street whilst a number of routes run near the site within 250 metres of the site which is considered a convenient walking distance. The nearest bus stops on Smith Street are located 200 metres north of the site while bus stops on both Frederick Street and Pearson Street west of the site are within 100 metres of the site.

The bus routes provide excellent bus services to many suburbs and a variety of railway stations, providing connection to and from many facilities, suburbs, and regions. A relatively new service, 'On Demand Bus Services' provided by Keolis Downer Hunter, operates pick up and drop off services for areas not serviced by the other routes usually within 30 minutes of booking the bus, based on the same cost structure as the standard service. The route for the on-demand service also runs along Smith Street past the site and would be of significant benefit to staff and visitors to the proposed private hospital.

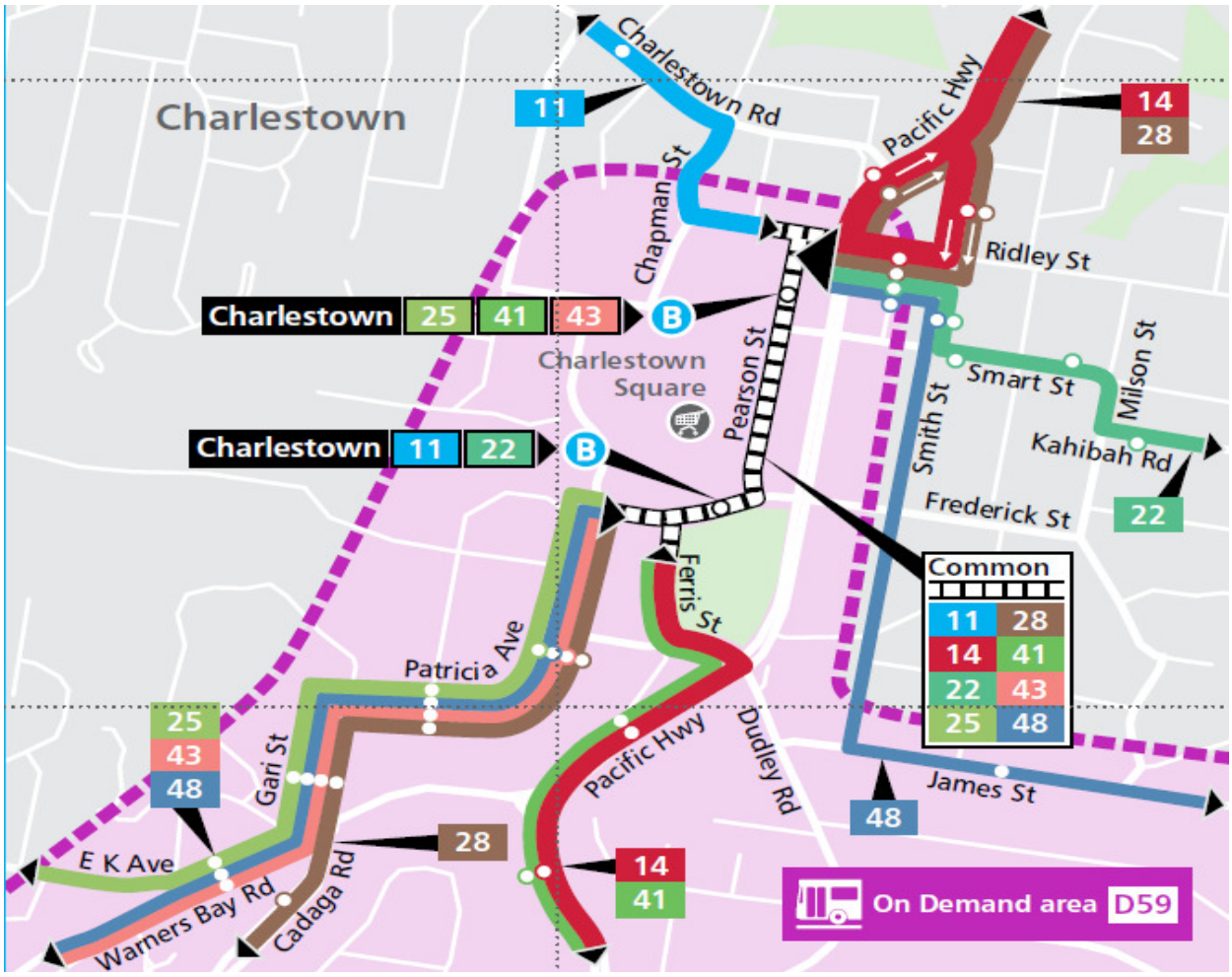


Figure 2 - Bus Routes

An excellent 1.2-metre-wide reinforced concrete footpath exists around the site along all road frontages connecting to nearby commercial developments and the Charlestown CBD area. These

footpaths are shown in ***Photographs 8 and 9*** below. The signalised intersection of the Pacific Highway and Frederick Street includes pedestrian phases allowing for the safe and convenient crossing of both the Pacific Highway and Frederick Street as shown in ***Photograph 10*** below. There are currently no cycle ways or marked on-road cycle lanes in the immediate vicinity of the site.

Photograph 8 – Pedestrian footpath – Pacific Highway

Photograph 9 – Pedestrian Footpath – Smith Street

Photograph 10 – Signalised pedestrian crossing – Frederick Street

8.0 DEVELOPMENT PROPOSAL

The proposed development involves the construction of a private hospital on the site. Specifically, the development will contain the following.

- At ground floor (level 1) – A GP Clinic (938 m^2 GFA) with capacity for 15 practitioners, 3 nurses and 3 administration staff, an Imaging tenancy (464 m^2 GFA) with capacity for 5 practitioners and 2 administration staff, a pathology tenancy (118m^2 GFA) with room for up to 4 collection rooms, a retail pharmacy (220 m^2 GFA) and a skin clinic (247 m^2 GFA) with capacity for 5 practitioners, 2 nurses and 2 administration staff. A combined entry / exit off Frederick Street is provided to facilitate satisfactory servicing of the site without service vehicles using Smith Street as well as provide access to a patient drop off and pick up area near the lift lobby. The service and patient drop off area operates as a one-way traffic flow to 4 loading bays and 2 ambulance bays with a circular flow back to Frederick Street. A lift lobby with pedestrian access from the Pacific Highway and the level 1 car park is also included along with ancillary store rooms and waste room. Ground level also includes the first level of car parking only accessed via the Smith Street access providing 81 unsecured on-site car spaces.
- Level 2 containing a 79-car space visitor and staff car park accessed off Smith Street via a combined entry / exit driveway with a lift lobby as well as 13 Allied Health tenancies ranging in size from 84 m^2 to 243 m^2 NLFA – Total NLFA = 1,876 m^2). A meeting room, amenities and lift lobby are also provided in Level 2.
- Level 3 containing an 85 car space staff only parking area (secured) including 2 accessible spaces as well as 13 Allied Health tenancies ranging in size from 60 m^2 to 335 m^2 NLFA – Total NLFA = 1,876 m^2). Amenities and lift lobby are also provided in Level 3.
- Level 4 – Surgical level (Private Hospital) 2,292 m^2 GFA with capacity for 2 operating theatres and 23 bed in-patient surgical ward with up to 2 doctors, 2 anaesthetists and 15 nurses on-site at any one time; and
- Drainage and Landscaping to Lake Macquarie City Council requirements.

The concept plans are provided within ***Attachment A***.

9.0 TRAFFIC GENERATION

The *RTA's Guide to Traffic Generating Development's* provides specific advice on the traffic generation potential of various land uses.

In regard to private hospitals the advice provided within the guide is as follows and is based on old surveys of private hospitals in Sydney.

Private Hospitals

Peak Period Traffic Generation Models
PVT = -14.69 + 0.69 B + 0.31 ASDS (R2 = 0.74)
MVT = -10.21 + 0.47 B + 0.06 ASDS (R2 = 0.64)
EVT = -2.84 + 0.25 B + 0.40 ASDS (R2 = 0.69)

PVT = -22.07 + 1.04 B (R2 = 0.63)
MVT = -12.41 + 0.57 B (R2 = 0.55)
EVT = -11.96 + 0.69 B (R2 = 0.44)

Where:

B = No. Beds and ASDS = average number of staff per weekday day shift

As staff numbers are not known the model that could be used is the bed only model however with 23 in-patient beds provided the model predicts negative traffic generation therefore is not considered suitable for this development. Advice from the client is that average staff numbers per weekday shift is likely to be in the order of 18 staff therefore the bed and staff models predicts the following.

PVT = peak vehicle trips = -14.69 + 0.69 x 23 + 0.31 x 20 = 7.38 say **8 vtph**.
MVT = morning commuter peak hour trips = -10.21 + 0.47 x 23 + 0.06 x 20 = 1. 8 vtph say **2 vtph**
EVT = evening commuter peak hour trips = -2.84 + 0.25 x 23 + 0.4 x 20 = 10.91 say **11 vtph**.

It is noted that the reasoning for lower morning MVT is that staff change of shifts don't coincide with the morning road network peak but can coincide with the evening peak hour trip. Therefore, in terms of the operation of the private hospital which represents the top level of the development only, the available traffic generation data suggests that the evening peak hour is the critical peak and a value of 11 vtph has been adopted in this assessment. Assuming some patients would also arrive during the morning peak the PVT rate of 8 vtph has been adopted for the morning peak in this assessment.

Medical Consultancies

There is no relevant traffic generation data for professional consulting rooms available in the RMS Guide though the United States of America's Institution of Transportation Engineers recommends a trip generation rate of 5.18 trips per 1000 ft^2 GFA for a medical clinic. This converts to 5.58 trips per 100 m^2 GFA. It is considered that this is the most relevant data to determine a likely peak traffic generation from the medical consultancies on the site.

On this basis the additional peak hour traffic generation from the professional consulting rooms can be calculated as follows noting the total floor area of these tenancies is approximately 3,432 m^2;

Peak traffic generation = 3,432 m^2 GFA/100 m^2 GFA x 5.58 vehicle trips per hour (vtph).
= 210 vtph.

It is also assumed the AM and PM peak for these tenancies are the same. It is however noted that all consulting rooms will not be operating at the same time as many of the consultants would generally have 1 or 2 days operating in various hospitals including this hospital and would also operate out of consulting rooms at, at least one other location. The operator has advised that based on other similar developments they operate peak consulting room occupancy is only up to 70% of the rooms. On this basis the adopted traffic generation for the consulting rooms is as follows.

Peak AM and PM traffic generation = 0.7 x 210 = **147 vtph**

Retail Tenancies

While it is likely these tenancies will be ancillary to the rest of the development and unlikely to generate additional traffic to ensure this assessment is robust traffic generation from these tenancies has been included in the assessment.

RTA data for shops with a floor area of less than 1,000 m^2 is as follows.

Weekday peak hour = 12.5 vtph per 100 m^2 NLFA.

Noting the retail tenancy (pharmacy) has an area of approximately 220 m^2 GFA and that NLFA is assumed as 80% of GFA the peak hour traffic generation for the retail tenancies can be calculated as.

Weekday peak hour = 12.5 vtph / 100 x 0.8 x 220 = **22 vtph**.

Again, morning and evening peak hour volumes for the retail tenancies have been assumed as the same.

GP Clinic, Imaging tenancy, Pathology tenancy and Skin Clinic

In considering the traffic generation for these components of the development the *RTA's Guide to Traffic Generating Developments* rate for Extended Hours Medical Centres is considered the most relevant available data.

The mean AM and PM peak generation rates sourced from the Guide are.

AM peak - 10.4 veh/hr/100 m^2 GFA; and
PM peak - 8.8 veh/hr/100 m^2 GFA.

Noting the combined area of the GP Clinic, Skin Clinic, Imaging tenancy and Pathology tenancy as 1,987 m^2 NLFA then the peak AM and PM traffic generation can be calculated as follows.

AM peak = 1,987 / 100 x 10.4 = 207 vtph
PM peak = 1,987 / 100 x 8.8 = 175 vtph.

However, it is noted that there will be significant cross-use of the GP clinic and the Imaging and Pathology tenancies, and the GP clinic is only likely to operate with at maximum a consulting room occupancy of 70% based on other similar developments constructed by the proposed operator of this development. Therefore, again peak traffic volumes are likely to be reduced by at least 70% because of these factors. Therefore, the adopted peak hour traffic generation for the ground floor medical clinics is as follows.

AM peak = 0.7 x 207 = **145 vtph**; and
PM peak = 0.7 x 175 = **123 vtph**.

Therefore, the total traffic generation from the development can be determined by adding the component traffic generations calculated above and is as follows.

- Weekday AM peak hour traffic generation = 8 + 147 + 22 + 145 = **322 vtph**; and
- Weekday PM peak hour traffic generation = 11 + 147 + 22 + 123 = **303 vtph**.

In distributing these trips onto the local road network, the following assumptions have been made.

- Traffic with origin / destination to the south-west (30%) would utilise Frederick Street and Smith Street with 10 % using the Frederick Street car park access and 90 % the Smith Street car park access. Note due to there being no right turn at the Pacific Highway signals 50 % of this traffic would utilise the western leg of Frederick Street to access the site and 50 % will utilise the southern leg of Smith Street to access Frederick Street.
- Traffic with origin / destination to the west and north-west (30%) - 10 % would utilise Frederick Street to access the Frederick Street car park (10%), and 90% would utilise Ridley Street and Smith Street to access the Smith Street car park.
- Traffic with origin / destination to the east and north-east (40%) - 10% would utilise Frederick Street to access the Frederick Street car park and 90% would utilise Ridley Street and Smith Street to access the Smith Street car park, except that vehicles leaving the site with origins / destinations north and northeast will utilise Frederick Street as there is no right turn movement allowed at the Pacific Highway Ridley Street intersection; and
- In both the AM and PM peaks the inbound and outbound movements have been split 50:50.

The resulting development traffic trip distribution is shown below in ***Figure 3***.

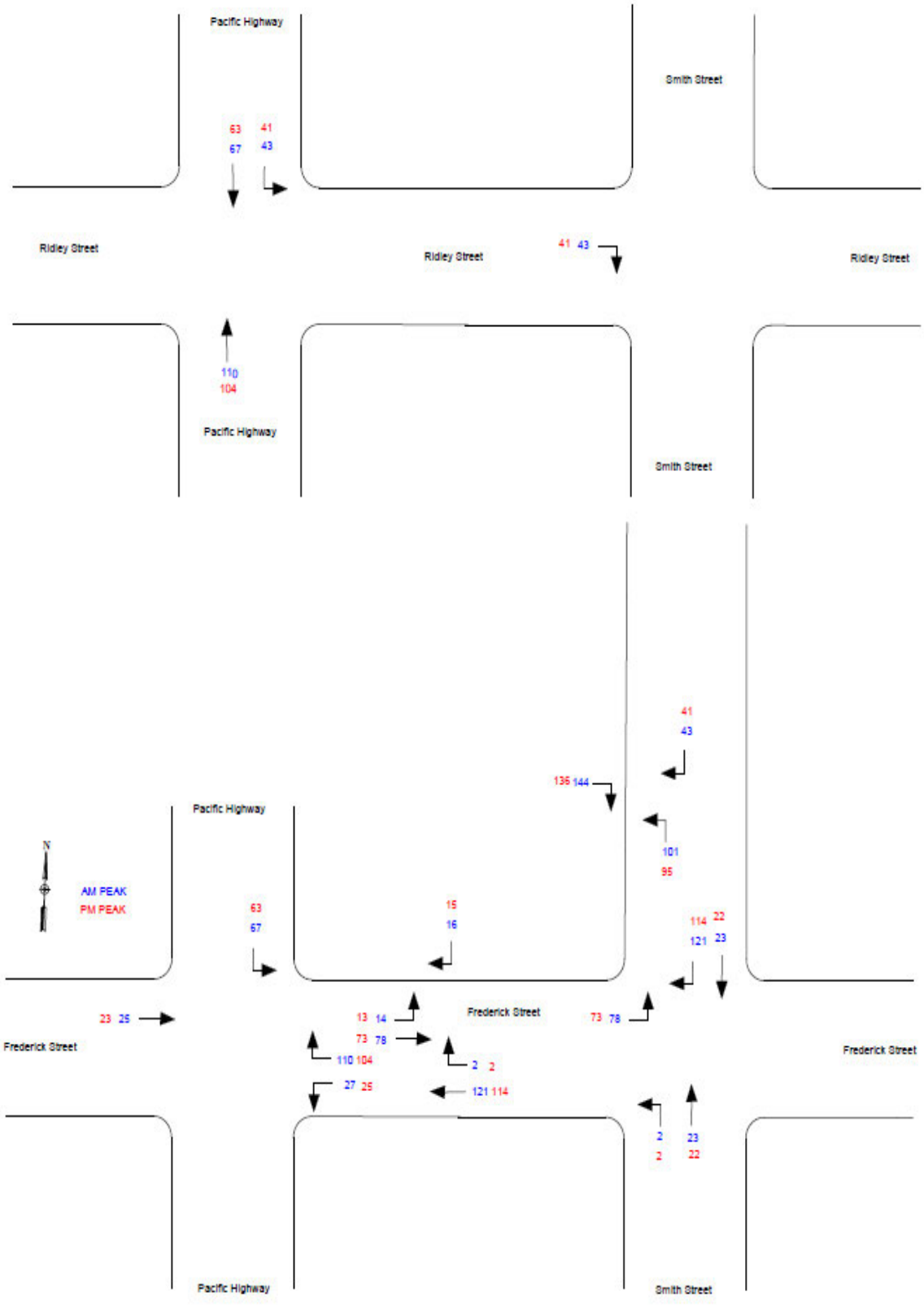


Figure 3 – Development traffic trip distribution

10.0 TRAFFIC IMPACTS OF DEVELOPMENT

10.1 – Road Network Capacity

It has previously been shown in ***Section 6*** of this report that the local road network is currently operating within its technical capacity for two-way mid-block traffic volumes. Based on the traffic distribution provided in ***Figure 4*** above, the development will increase the two-way mid-block traffic volumes as follows.

- Pacific Highway north of Frederick Street – 134 vtph in the AM peak and 126 vtph in the PM peak.
- Pacific Highway south of Frederick Street – 27 vtph in the AM peak and 25 vtph in the PM peak.
- Frederick Street east of Pacific Highway – 170 vtph in the AM peak and 159 vtph in the PM peak.
- Frederick Street west of Pacific Highway – 25 vtph in the AM peak and 23 vtph in the PM peak.
- Smith Street north of Frederick Street – 202 vtph in the AM peak and 190 vtph in the PM peak; and
- Smith Street south of Frederick Street – 48 vtph in the AM peak and 46 vtph in the PM peak.

When this additional traffic is added to the existing traffic volumes on the road network and including a background traffic growth rate of 1.5 % per annum the following two-way mid-block capacity assessment as shown in ***Table 2*** below is carried out.

Table 2 – Two-way mid-block traffic volumes.

Road	Section	Capacity	2022		2032 @ 1.5% p.a.		Development traffic	
		vtph	AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)	AM	PM
Pacific Highway	north of Frederick Street	4400	2776	2641	3193	3038	177	167
Pacific Highway	south of Frederick Street	4400	2467	2411	2859	2794	27	25
Frederick Street	east of Pacific Highway	1800	635	655	703	728	213	200
Frederick Street	west of Pacific Highway	1800	269	546	308	630	25	23
Smith Street	north of Frederick Street	1800	679	569	749	623	245	231
Smith Street	south of Frederick Street	1800	343	300	390	341	48	46

This assessment has shown that even with the additional development traffic from the proposed private hospital and background traffic growth the local and state road network will remain below the two-way mid-block capacity of the road network through to and beyond 2032.

It is therefore concluded that subject to satisfactory intersection performance the development will not adversely impact on the local and state road network.

10.2 – Intersection Capacity

The main intersections of concern in assessing this development are.

1. Pacific Highway / Frederick Street intersection – four-way signalised intersection.
2. Frederick Street / Smith Street intersection – give way controlled cross intersection.
3. Pacific Highway / Ridley Street intersection – four-way signalised intersection; and
4. Ridley Street / Smith Street intersection – give way controlled cross intersection.

Whilst no data was collected for the Ridley Street intersections the impact of the development on the Pacific Highway / Ridley Street intersection and the Ridley Street / Smith Street intersection would be significantly less than on the Frederick Street intersections which will remain the main traffic route to the hospital. Traffic volume increases through Ridley Street would be less than 10% of total traffic volumes through the intersections and thus any impact would not be noticeable. Therefore, it is reasonable to conclude that if the hospital does not impact on the Frederick Street intersections it will not impact on the Ridley Street intersections north of the site.

To assess the impact of this development on intersections 1 and 2 they have been modelled using the Sidra Intersection modelling program. This micro-analytical program identifies "Level of Service" (LoS) criteria for intersection analysis which range from LoS A to LoS F, with a LoS F deemed an intersection 'failure' with delays in excess of 70 seconds. Assessment is then based on the level of service requirements of the RMS shown below.

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & 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 excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Source: - RTA's Guide to Traffic Generating Developments (2002).

These intersections have been modelled for post development 2022 and for 2032 with 1.5 % per annum background growth justified in ***Section 5*** in both the AM and PM peak periods. In undertaking the modelling development traffic trip distribution for this development was as per ***Figure 3*** and no upgrades were for the intersections was initially assumed. A cycle time of 80 seconds was used for the signalised intersection and the intersections were modelled as a network.

The results of the modelling for the *'all movements'* summary and the worst level of service (LoS) are summarised in ***Table's 3*** and ***4***. The Sidra movement summary tables are provided in ***Attachment C.***

Table 3 – Sidra results – Pacific Highway / Frederick Street – Signalised.

Modelled Peak	Degree of Saturation (v/c)	Average Delay (s)	Level of Service	95% back of queue length (cars)
2022 AM	0.471	21.3	B	11.5
2022 PM	0.542	31.9	C	13.3
2022 AM + development	0.598	32.9	C	15.1
2022 PM + development	0.628	37.8	C	15.7
2032 AM	0.561	23.5	B	14.8
2032 PM	0.651	35.4	C	17.2
2032 AM + development	0.713	35.9	C	19.2
2032 PM + development	0.756	41.9	C	19.9

This modelling shows the intersection currently is operating satisfactorily during both the AM and PM peak periods. Post development through to 2032 the intersection continues to operate with satisfactory levels of service. The impact of the development is only to increase average delays by

up to 5 seconds and queue lengths by 5 vehicles in the AM & PM peaks. It is noted queue lengths on the Frederick Street west leg do queue back into the Pearson Street signals both pre and post development for 2022 and 2032. Therefore, it can be concluded that the Sidra Intersection modelling demonstrates that the development does not adversely impact on the operation of the Pacific Highway / Frederick Street intersection and would therefore also be reasonable to conclude that the development will not adversely impact on other intersections on the state road network.

Table 4 – Sidra results – Frederick Street / Smith Street – Give way.

Modelled Peak	Degree of Saturation (v/c)	Worst Average Delay (s)	Worst Level of Service	Worst 95% back of queue length (cars)
2022 AM	0.252	7.9	A	0.4
2022 PM	0.153	7.0	A	0.3
2022 AM + development	0.318	9.0	A	0.6
2022 PM + development	0.326	7.8	A	0.6
2032 AM	0.315	8.8	A	0.6
2032 PM	0.187	7.6	A	0.3
2032 AM + development	0.434	11.7	A	1.1
2032 PM + development	0.424	9.5	A	1.1

This modelling shows that the Frederick Street / Smith Street intersection will continue to operate satisfactorily post development through to 2032 with little if any delay or queuing occurring i.e., almost uninterrupted flow conditions. The impact of the development is only to increase average delays by less than 3 seconds and queue lengths less than 1 vehicle. Therefore, it can be concluded that the Sidra Intersection modelling demonstrates that the development does not adversely impact on the operation of the Frederick Street / Smith Street intersection and would therefore also be reasonable to conclude that the development will not adversely impact on other intersections on the local road network.

10.3 – Access

The on-site car parking for this development will be accessed via two new combined entry / exit driveways off Frederick Street and Smith Street. A set down / pick up area and servicing / emergency vehicle parking combined entry / exit access will be located on Frederick Street mid-block between the Pacific Highway and Smith Street. The Smith Street access located mid frontage will service the multi-level car park containing 245 on-site car spaces. These two accesses replace four existing vehicular accesses to the site therefore does not represent an intensification of accesses along the street frontages and therefore will not result in any loss of on-street car parking.

In accordance with the requirements of Australian Standards *AS 2890.1-2004 Parking Facilities – Off-street car parking* whereby the access to the development is providing access to a user class 3 (medical centres) car parking facility of between 100 and 300 car spaces fronting a local road the Smith Street access is required to be a category 3 access (Table 3.1 of *AS 2890.1-2004*). Table 3.2 of *AS 2890.1-2004* specifies a category 3 access facility as separate entry and exit driveways (minimum 1 metre separation. i.e., median separated) with a 6-metre-wide entry lane and a 4- to 6-metre-wide exit lane. A suitable access has been provided to Smith Street with the Australian Standard requirements at the kerb line being met. The Frederick Street access will support 4 loading bays, 2 ambulance bays and a 4-space patient drop off area therefore under AS2890.1-2004 will be required to be a minimum category 1 access however due to the heavy vehicle use is provided as an 8.5-metre-wide combined entry / exit driveway (at the kerb line) to accommodate the swept paths for the heavy vehicles entering and exiting the site. The proposed access arrangements for the development therefore comply with the requirements of *AS2890.1-2004*. Pedestrian and vehicular sight lines from the accesses as required by *AS2890.1-2004* will be achieved at the accesses with the provision of appropriately design fencing and landscaping being

either transparent or lower than 1.2 metres high. Vehicular sight distances at the accesses have been observed to be a minimum 70 metres on Frederick Street and Smith Street which is considered compliant with AS2890.1-2004 for a 50 km/h speed frontage.

Overall, it is concluded that the proposed access arrangements are satisfactory and would comply with the requirements of Australian Standards *AS 2890.1-2004 Parking Facilities – Off-street car parking*.

10.4 – Off-Street Parking

With regard to on-site parking and manoeuvrability the proposal should comply with Australian Standard *AS2890.1-2004 Parking facilities – Off-street car parking* and *Part 4 of Lake Macquarie City Council's DCP – Development in Business Zones (LMCC DCP (2014))*.

In terms of the uses of the site the following parking rates from LMCC DCP (2014) are applicable.

Retail Tenancies / Shops

Car Parking – 1 space per 25 m^2 GFA (Area less than 5,000 m^2).
Bicycle Parking – 10 % of car parking; and
Motorcycle Parking – 1 space per 20 car parks.

Medical Centres – GP Clinic, Imaging Tenancy, Skin Clinic

Car Parking – 1 space per on-duty practitioner plus 1 space per 2 additional equivalent full-time employees plus 1.5 spaces per consulting room plus 1 space for delivery and collection service.
Bicycle Parking – 10 % of car parks.
Motorcycle Parking – 1 space per 20 car parks.

Medical Centres – Private Hospital

Car Parking – 1 space per 2 beds, plus 1 space per 2 staff, plus Ambulance spaces.
Bicycle Parking – 10 % of car parks.
Motorcycle Parking – 1 space per 20 car parks.

Medical Centres – Collection Centre (Pathology)

Car Parking – 1 space plus 1 space per collection room plus 1 space for delivery and collection service.
Bicycle Parking – 10 % of car parks.
Motorcycle Parking – 1 space per 20 car parks.

Health Consulting Rooms

Car Parking – 1 space per on-duty practitioner plus 1 space per 2 additional equivalent full-time employees plus 2 spaces per consulting room.
Bicycle Parking – 10 % of car parks.
Motorcycle Parking – 1 space per 20 car parks.

Using the above rates, the individual component parking requirements can be calculated as follows noting the staffing levels for each component as stated below.

1. GP Clinic – (Peak occupation 15 on-site practitioners plus 3 administration staff and 3 nurses).

Car parking = 15 + 6/2 + 15 x 1.5 + 1 = 42 spaces
Bicycle Parking = 10% of 42 = 4 spaces
Motorcycle parking = 42/20 say 2 spaces.

2. Imaging Tenancy – (5 on-site practitioners + 2 administration staff)

Car parking = 5 + 2/2 + 5 x 1.5 + 1 = 15 spaces.
Bicycle Parking = 10% of 15 = 1 spaces.
Motorcycle parking = 15/20 say 1 space.

3. Skin Clinic – (5 on-site practitioners + 2 administration staff + 2 nurses)

Car parking = 5 + 4/2 + 5 x 1.5 + 1 = 16 spaces.
Bicycle Parking = 10% of 16 = 2 spaces.
Motorcycle parking = 16/20 say 1 space.

4. Private Hospital – 23 beds – (4 on-site practitioners + 2 administration staff + 15 nurses)

Car parking = 23/2 + 21/2 = 22 spaces.
Bicycle Parking = 10% of 22 = 2 spaces.
Motorcycle parking = 22/20 say 1 space.

5. Collection Centre – (4 collection rooms))

Car parking = 1 + 4 x 1 + 1 = 6 spaces.
Bicycle Parking = 10% of 6 = 0 spaces.
Motorcycle parking = 6/20 say 0 space.

6. Health Consulting Rooms (26 rooms) – (Peak occupation 39 on-site practitioners + 40 administration staff)

Car parking = 39 + 40/2 + 39 x 2 = 137 spaces.
Bicycle Parking = 10% of 137 = 14 spaces.
Motorcycle parking = 137/20 say 7 spaces.

Therefore, the total parking requirement for the development is as follows.

Car Parking = 42 + 15 + 16 + 22 + 6 + 137 = 238 spaces.
Bicycle spaces = 4 +1 + 2 + 2 + 7 = 16 spaces; and
Motorcycle Parking = 2 + 1 + 1 + 1 + 4 = 9 spaces.

Note this calculation does not account for likely parking concessions relating to cross-use of the medical facilities therefore is considered a robust assessment of parking demand. Further with 238 car spaces a supply of at least 5 accessible spaces is required.

As the development proposes 245 on-site car spaces including 6 accessible spaces and an appropriate number of EV charging stations it is reasonable to conclude that sufficient on-site car parking is provided which represents an excess of parking against the DCP requirement. Whilst no bicycle parking or motorcycle parking is shown on the plans there is sufficient room within the car park either adjacent to lift lobbies, stairwells or within the excess parking to accommodate the bicycle and motorcycle parking required.

A review of the plans indicates that by scaling the parking layout also complies with the requirements of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 - Off-street car*

parking facilities in regard to the size of parking modules and circulating aisles for Class 3 parking. The car park layout provides excellent circulation ensuring convenient manoeuvrability through the site and forward entry and exit from the site while the internal one-way ramp from level 1 to level 2 will reduce circulating traffic on the local road network as visitors seek an on-site car park therefore also reducing traffic at the level 1 and level 2 car park accesses. Convex safety mirrors will be provided at entry and exit to ramps where it is identified that some sighting issues would arise. These can be conditioned on the consent and included in Construction Certificate documentation.

Servicing of the site will be via small rigid vehicles or light vehicles for supplies / collections and medium rigid vehicles for waste collection. Three light or small vehicle loading bays and a heavy vehicle loading bay is provided at ground level off Frederick Street as well as two ambulance bays satisfying the requirements of the LMCC DCP (2014). Service and waste collection vehicles will be able to enter and exit the site in a forward direction. Servicing will be infrequent and occur outside peak parking demand periods for the development ensuring impact on and inconvenience to visitors is minimised. Note: The Frederick Street access will be suitably delineated by appropriate signage as a set down / pick-up only as well as a servicing and emergency vehicle parking area. The hospital's building manager will also be responsible for enforcing these conditions using appropriate car parking management personnel.

Overall, it is concluded that sufficient and suitable on-site parking and servicing facilities are provided within the development and that the internal car parking and manoeuvring areas proposed for the development are considered satisfactory.

11.0 PEDESTRIAN FACILITIES

The proposed development will generate additional pedestrian traffic as visitors seek to utilise the services provided not only from the on-site car parking but from nearby bus stops, car parks and shopping centres. A suitable concrete footpath network already exists along the Pacific Highway, Frederick Street and Smith Street. Pedestrian crossing facilities are available at the signalised traffic signals at the Pacific Highway / Frederick Street intersection and via marked pedestrian crossings of Frederick Street and Smith Street at the Frederick Street / Smith Street intersection (see ***Photograph 11***). It is therefore concluded that the existing pedestrian facilities around the site are suitable and maintaining these facilities as part of the development works ensures no nexus exists for additional pedestrian facilities in the area.

The proposed awning on the Pacific Highway frontage will be the subject of a separate Roads Act 1993 S138 approval prior to construction and the issue raised by TfNSW will be addressed in this process whereby TfNSW will be able to condition any specific sight distance requirements. However, by general comment the awning is not considered to impede sighting of the signals at the Pacific Highway / Frederick Street intersection.

12.0 ALTERNATE TRANSPORT MODE FACILITIES

The proposed development is expected to generate increased patronage of the existing public transport system (buses) however the site is already well serviced by public transport with a number of routes passing by or near the site. There are also a number of nearby bus stops with seats and shelters in close proximity to the site. However, in discussions with Keolis Downer it has been recommended that a new bus stop be provided to service the hospital on the western side of Smith Street immediately north of Frederick Street. This will allow existing bus route 48 to service the site. Keolis Downer have indicated their support for this location (see ***Attachment D***). Therefore, it is concluded that the existing public transport services and infrastructure in the vicinity of the site is suitable for the development. Changes to the existing public transport system or

additional infrastructure are therefore not required. Similarly, whilst the development may generate some additional bicycle traffic, the level of the increase will not be enough to warrant the provision of additional cycle ways in the vicinity of the site. Bicycle racks and end of trip facilities will be provided within the development for use by staff and visitors.

Photograph 11 – Marked Pedestrian Crossing – Smith Street at Frederick Street

13.0 CONCLUSIONS

This traffic and parking assessment for a proposed private hospital on Lots 1 & 2 DP 877977 – 33 Smith Street, Charlestown has determined the following.

- The existing local and state road network is operating within the technical two-way mid-block capacity of the network.
- It is expected that the additional traffic generated by the development in the AM and PM peak period will be up to 322 vtph and 303 vtph respectively.
- There are a number of travel routes to the site from all directions and as a result the impact of traffic generated by the development will be dampened because of the use of all these travel routes.
- Following an assumed distribution of the development traffic onto the local and state road network it was found that the network has sufficient spare two-way mid-block capacity to cater for the additional development traffic without adversely impacting on current two-way mid-block levels of service (LoS) experienced by motorists on the road network.
- Sidra Intersection modelling of the Pacific Highway / Frederick Street signalised cross intersection showed that this intersection currently operates satisfactorily during the AM and PM peak traffic periods and would continue to do so post development through to 2032.
- Sidra Intersection modelling of the Frederick Street / Smith Street intersections has shown that this intersection currently operates satisfactorily during the AM and PM peak traffic periods and would continue to do so post development through to 2032.
- It is therefore reasonable to conclude that the development will not adversely impact on other intersections on the road network therefore will not adversely impact on both the local and state road networks.
- The proposed access arrangements are satisfactory and would comply with the requirements of Australian Standards AS 2890.1-2004 Parking Facilities – Off-street car parking. The provision of two separate accesses to the site is not an intensification of accesses to the site as they are only replacing existing site accesses and making two accesses redundant.

- That sufficient and suitable on-site parking and servicing facilities are provided within the development to not only meet the LMCC (2014) DCP requirements but met the expected peak parking demand generated by the development. The internal car parking and manoeuvring areas proposed for the development are compliant with AS2890.1-2004 for Class 3 parking and considered satisfactory for use by the development.
- Suitable motorcycle parking and bicycle storage is required within the car park however sufficient space exist within the car park to provide such infrastructure which could be conditioned on any consent issued for the development.
- Servicing of the site will be via small rigid vehicles or light vehicles for supplies, collection and via an MRV for waste collection. Suitable loading / service bays are provided within the ground level servicing area that allow the vehicles to enter and exit the site in a forward direction. Servicing will be infrequent and occur outside peak parking demand periods for the development ensuring impact on and inconvenience to visitors is minimised.
- Existing pedestrian facilities in the vicinity of the site are satisfactory and no nexus exists for additional pedestrian facilities as long as the existing infrastructure is maintained or embellished as part of the development works.
- The existing public transport services and infrastructure in the vicinity of the site is considered suitable for the development. Changes to the existing public transport is not required however a new bus stop in Smith Street along the site frontage is required to suitably service the site. Keolis Downer have been consulted on this and support the provision of the new bus stop.
- Whilst the development may generate some additional bicycle traffic the level of the increase will not be enough to warrant the provision of additional cycle ways in the vicinity of the site. Bicycle racks and end of trip facilities for use by visitors and staff will be provided within the development.

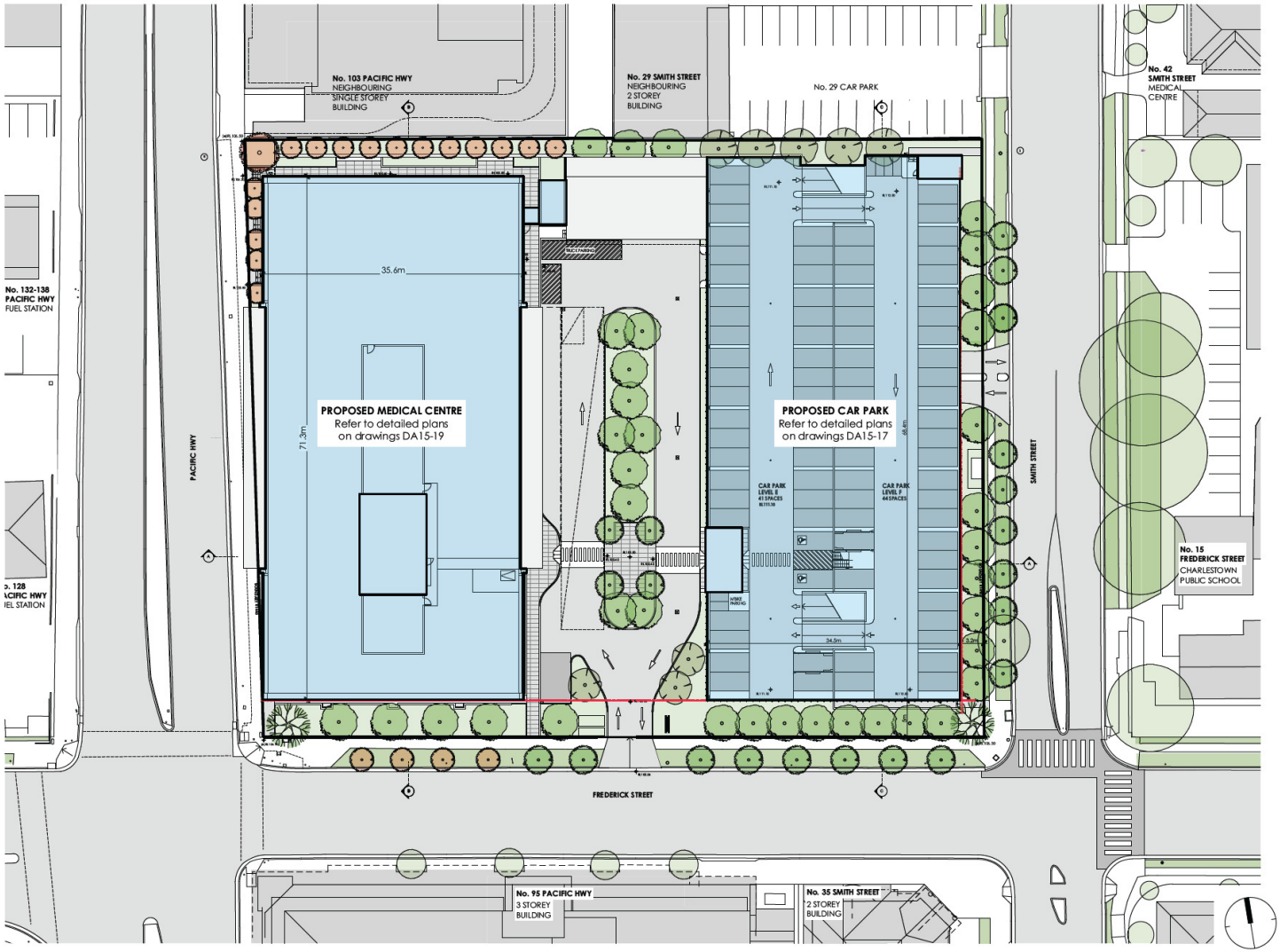
14.0 RECOMMENDATION

Having carried out this traffic and parking assessment for a proposed private hospital on Lots 1 & 2 DP 877977 – 33 Smith Street, Charlestown, it is recommended that the proposal can be supported from a traffic impact perspective as it will not adversely impact on the local and state road network and complies with all relevant Lake Macquarie City Council, Australian Standard and TfNSW requirements.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

ATTACHMENT A

Development Plans

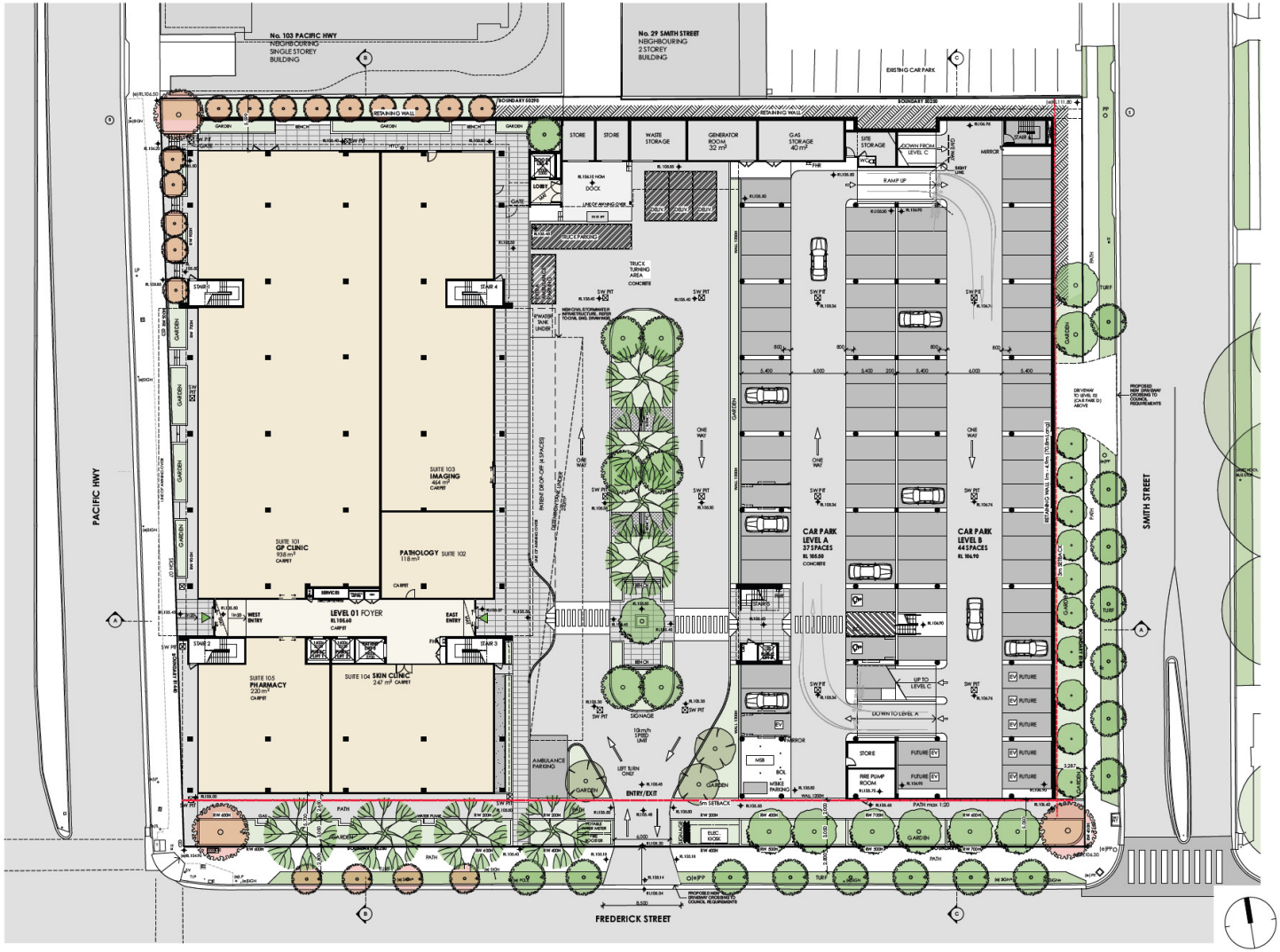


ARCHADIA

Proposed Site Plan **DA13**

A106.Proposed Medical Centre
31-33 Smith Street CHARLESTOWN
Nov 2022.Ver 2.2

Attachment A



AREAS

Site Area: 8096m²

Floor	GFA*	NLA
Level 1	2121m²	1987m²
Level 2	2289m²	1876m²
Level 3	2289m²	1876m²
Level 4	2299m²	2299m²
Total:	**8998m²**	**8038m²**
Plant	331m²**	
L1 Car Park	2426m²***	
L2 Car Park	2489m²	
L3 Car Park	2421m²	

Total Car Spaces*: 245 + 24 Bicycle + 12 M'Bike

* Measured to inside face of external walls
** Enclosed plant space 99m²
*** Covered area of Car Park
* Does not include Drop-off, Delivery or Ambulance Parking

LEGEND

B	BOLLARD
E	ELECTRICAL PIT
EV	ELECTRIC VEHICLE CHARGING
(e)	EXISTING
FHR	FIRE HOSE REEL
HYD	HYDRANT
LP	LIGHT POLE
PP	POWER POLE
RWO	RAIN WATER OUTLET
S	SEWER PIT
SV	STOP VALVE
SW	STORMWATER
T	TELSTRA PIT
TL	TRAFFIC LIGHT

1:400
0 4 8 20m

ARCHADIA

Level 1
A106.Proposed Health Services Facility
31-33 Smith Street CHARLESTOWN
Apr 2023.Ver 3.0

DA15 A

AREAS

Site Area: 8096m²

Floor	GFA*	NLA
Level 1	2121m²	1987m²
Level 2	2289m²	1876m²
Level 3	2289m²	1876m²
Level 4	2299m²	2299m²
Total:	**8998m²**	**8038m²**
Plant	331m²**	
L1 Car Park	2426m²***	
L2 Car Park	2489m²	
L3 Car Park	2421m²	

Total Car Spaces: 245 + 24 Bicycle + 12 M'Bike

* Measured to inside face of external walls
** Enclosed plant space 99m²
*** Covered area of Car Park

LEGEND

B	BOLLARD
E	ELECTRICAL PIT
(e)	EXISTING
FHR	FIRE HOSE REEL
HYD	HYDRANT
LP	LIGHT POLE
PP	POWER POLE
RWO	RAIN WATER OUTLET
S	SEWER PIT
SV	STOP VALVE
SW	STORMWATER
T	TELSTRA PIT
TL	TRAFFIC LIGHT

1:400

0 4 8 20m

ARCHADIA

Level 2
A106.Proposed Medical Centre
31-33 Smith Street CHARLESTOWN
Nov 2022.Ver 2.2

DA16 A

AREAS

Site Area: 809.6m²

Floor	GFA*	NLA
Level 1	2121m²	1987m²
Level 2	2289m²	1876m²
Level 3	2289m²	1876m²
Level 4	2299m²	2299m²
Total:	**8998m²**	**8038m²**
Plant	331m²**	
L1 Car Park	2426m²***	
L2 Car Park	2489m²	
L3 Car Park	2421m²	

Total Car Spaces^: 245 + 24 Bicycle + 12 M'Bike

* Measured to inside face of external walls
** Enclosed plant space 99m²
*** Covered area of Car Park
^ Does not include Drop-off, Delivery or Ambulance Parking

LEGEND

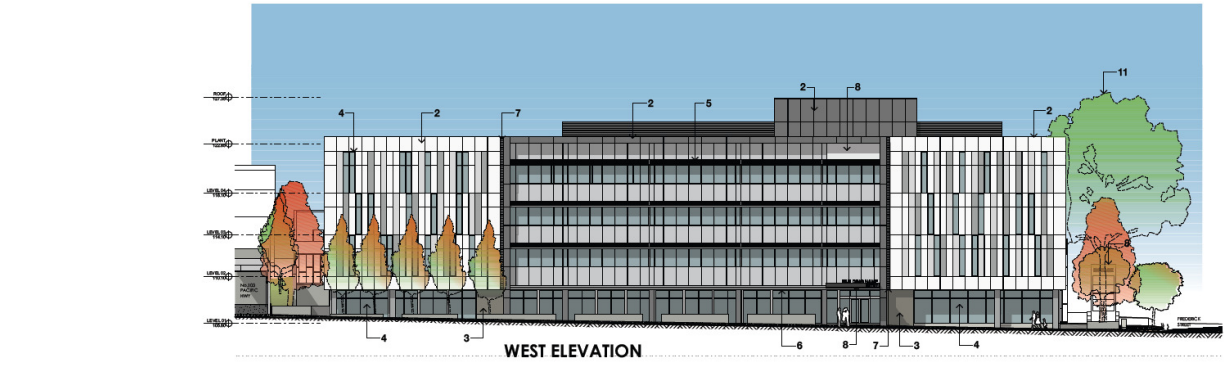
B	BOLLARD
E	ELECTRICAL PIT
EV	ELECTRIC VEHICLE CHARGING
(e)	EXISTING
FHR	FIRE HOSE REEL
HYD	HYDRANT
LP	LIGHT POLE
PP	POWER POLE
RWO	RAIN WATER OUTLET
S	SEWER PIT
SV	STOP VALVE
SW	STORMWATER
T	TELSTRA PIT
TL	TRAFFIC LIGHT

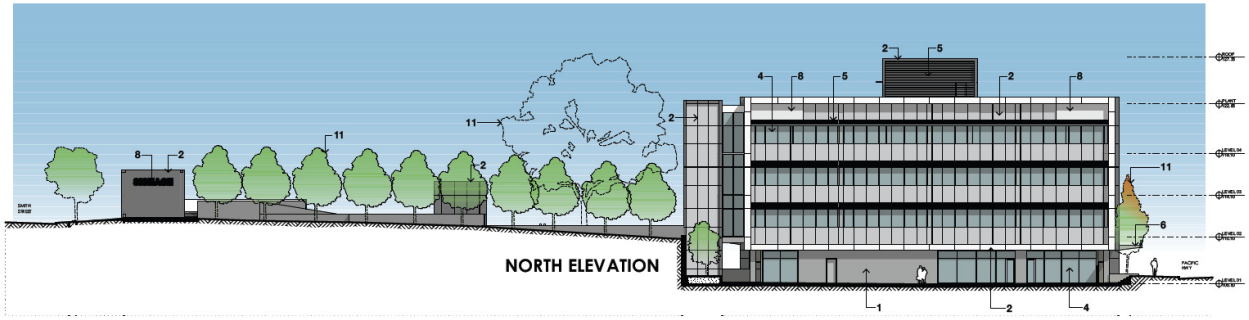
1:400
0 4 8 20m

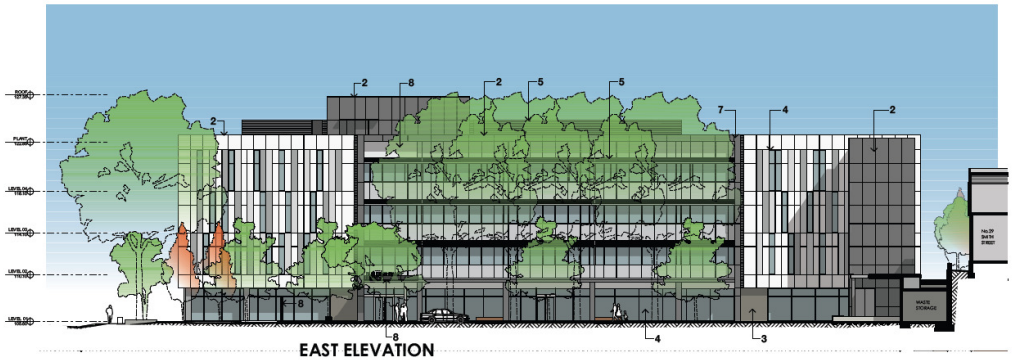
ARCHADIA

Level 3
A106.Proposed Health Services Facility
31-33 Smith Street CHARLESTOWN
Apr 2023.Ver 3.0

DA17 A







LEGEND

1. RENDERED BLOCKWORK. PAINT FINISH
2. LIGHT-WEIGHT CLADDING
3. MASONRY CLADDING
4. ALUMINIUM FRAMED DOUBLE-GLAZED WINDOWS
5. ALUMINIUM LOUVRES. POWDER COAT FINISH
6. STEEL FRAMED AWNING
7. ALUMINIUM LOUVRES. POWDER COAT FINISH
8. BUILDING SIGNAGE. REFER TO DETAILS ON DA14
9. ALUMINIUM BATTENS + MESH GREEN WALL POWDER COAT/GAL FINISH
10. PERF. METAL SCREEN. POWDER COAT FINISH
11. ON-SITE + OFF-SITE LANDSCAPING. REFER TO LANDSCAPE ARCH. DWGS.
12. PERF. METAL SCREEN ARTWORK. POWDER COAT FINISH

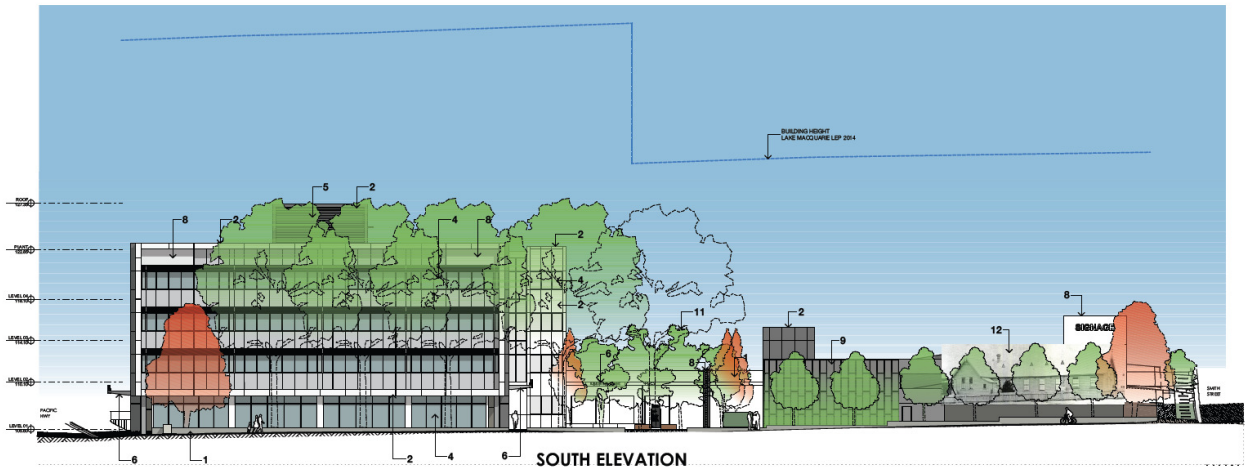
1:400

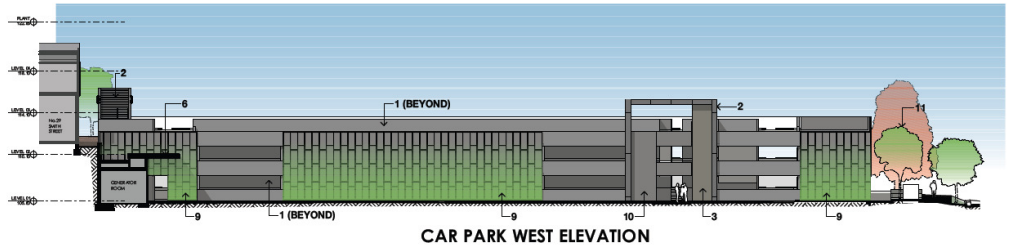
0 4 8 20m

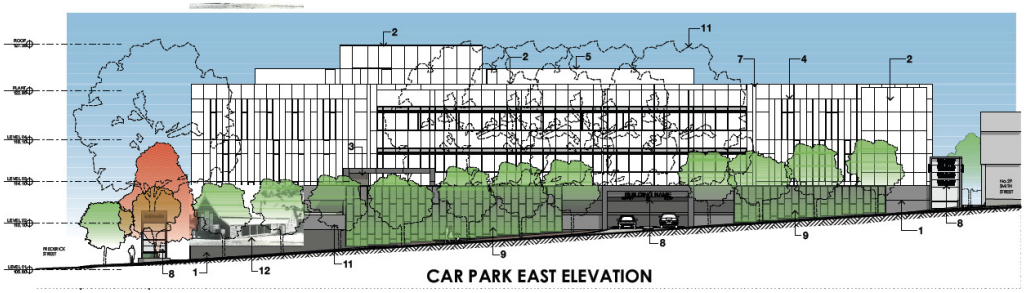
ARCHADIA

Elevations DA21

A106.Proposed Health Services Facility
31-33 Smith Street CHARLESTOWN
Apr 2023.Ver 3.0







LEGEND

1. RENDERED BLOCKWORK. PAINT FINISH
2. LIGHT-WEIGHT CLADDING
3. MASONRY CLADDING
4. ALUMINIUM FRAMED DOUBLE-GLAZED WINDOWS
5. ALUMINIUM LOUVRES. POWDER COAT FINISH
6. STEEL FRAMED AWNING
7. ALUMINIUM LOUVRES. POWDER COAT FINISH
8. BUILDING SIGNAGE. REFER TO DETAILS ON DA14
9. ALUMINIUM BATTENS + MESH GREEN WALL POWDER COAT/GAL FINISH
10. PERF. METAL SCREEN. POWDER COAT FINISH
11. ON-SITE + OFF-SITE LANDSCAPING. REFER TO LANDSCAPE ARCH. DWGS.
12. PERF. METAL SCREEN ARTWORK. POWDER COAT FINISH

1:400

0 4 8 20m

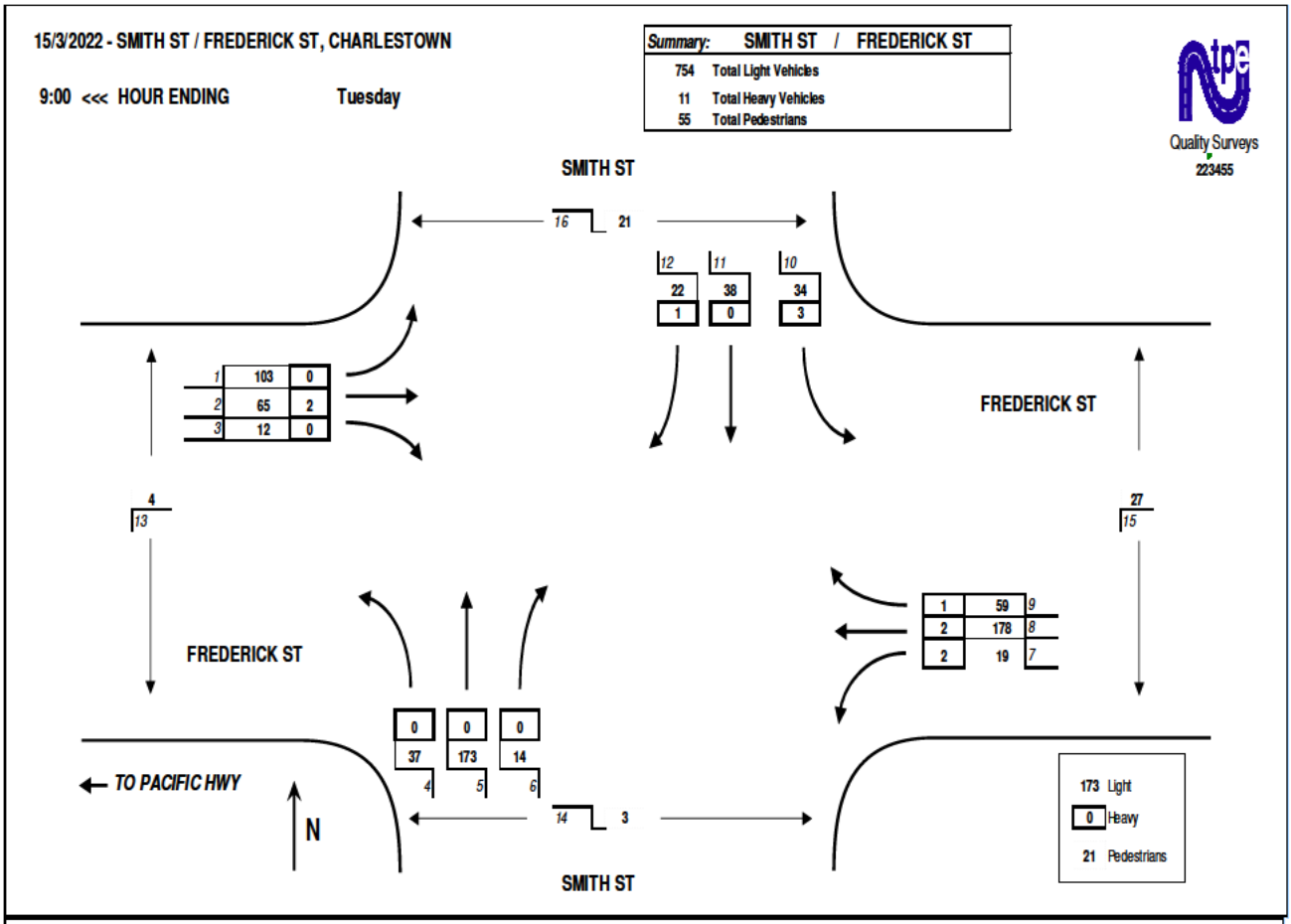
ARCHADIA

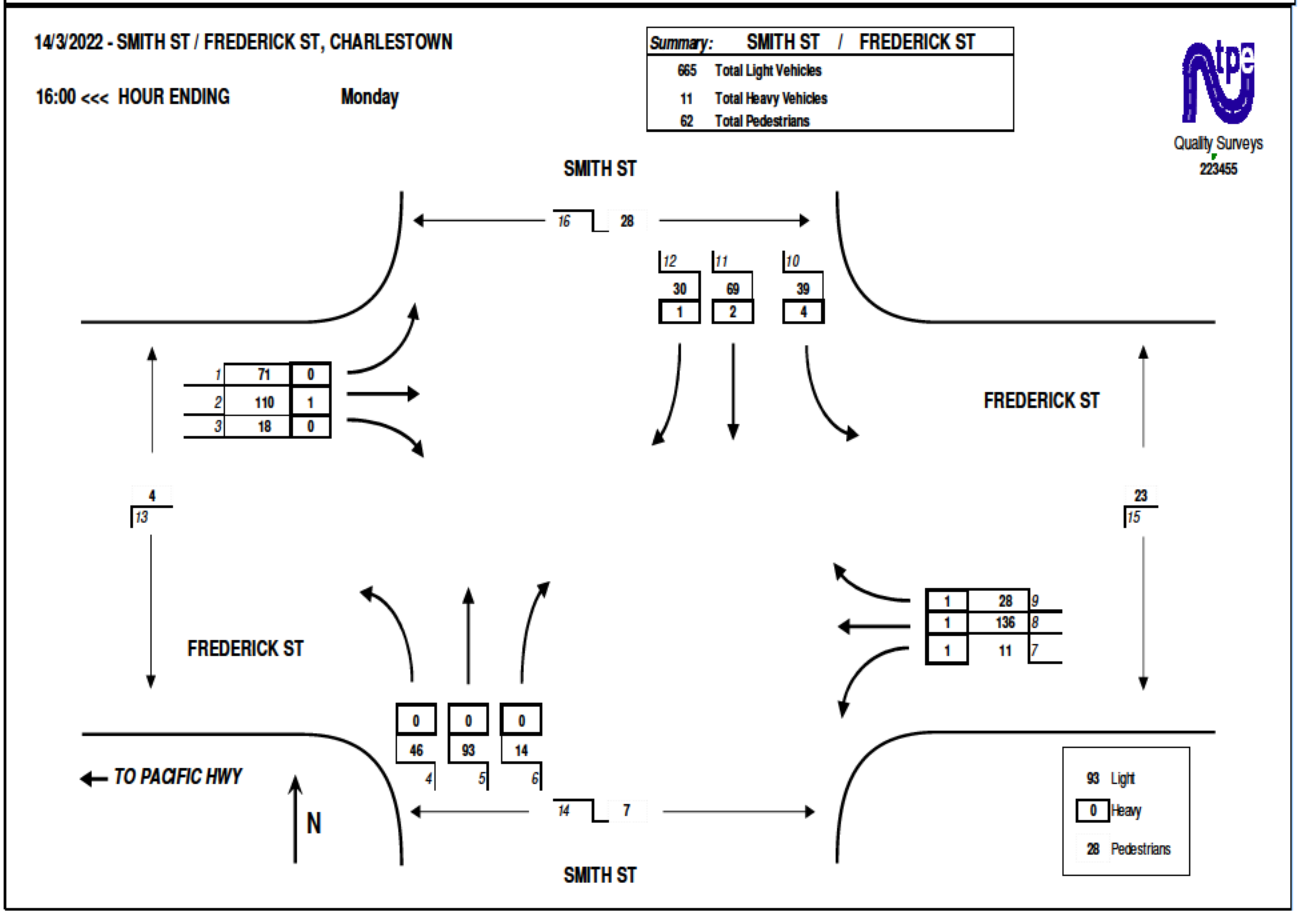
Elevations **DA22** A

A106.Proposed Health Services Facility
31-33 Smith Street CHARLESTOWN
Apr 2023.Ver 3.0

ATTACHMENT B

Traffic count tally sheets


15/3/2022 - SMITH ST / FREDERICK ST, CHARLESTOWN
9:00 <<< HOUR ENDING Tuesday
Summary: SMITH ST / FREDERICK ST
754 Total Light Vehicles
11 Total Heavy Vehicles
55 Total Pedestrians
Quality Surveys
223455
SMITH ST
16 21
12 11 10
22 38 34
1 0 3
1 103 0
2 65 2
3 12 0
FREDERICK ST
4
13
27
15
1 59 9
2 178 8
2 19 7
FREDERICK ST
0 0 0
37 173 14
4 5 6
TO PACIFIC HWY
N
14 3
SMITH ST
173 Light
0 Heavy
21 Pedestrians

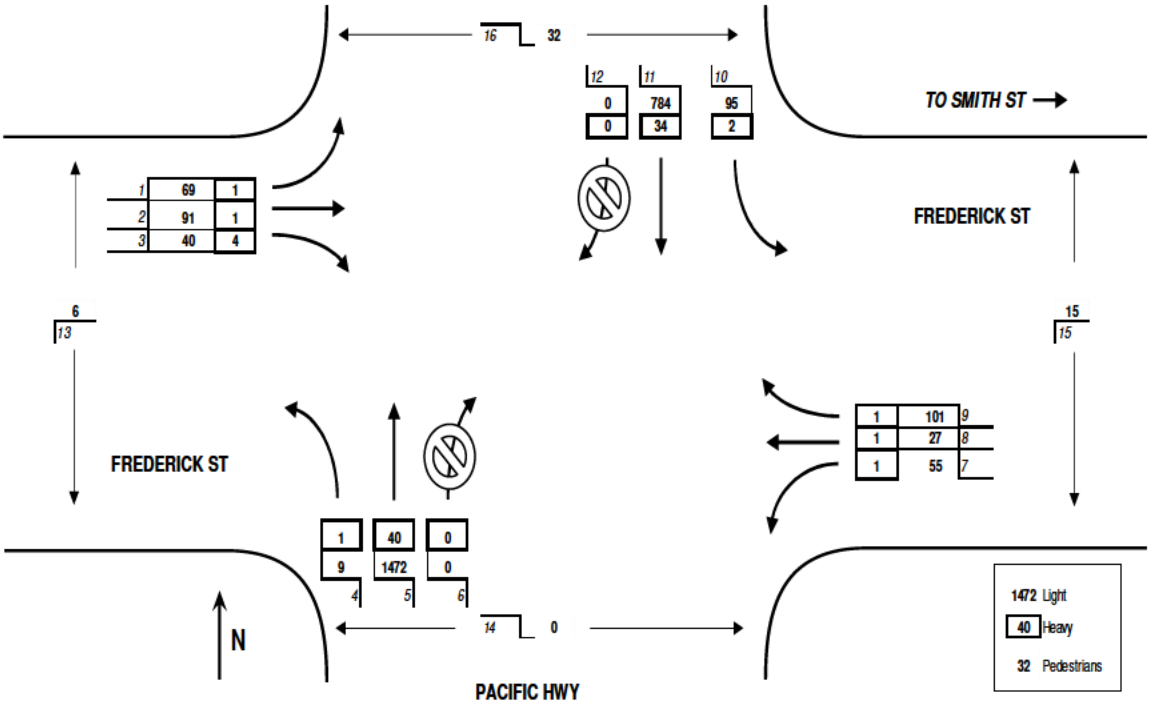

14/3/2022 - SMITH ST / FREDERICK ST, CHARLESTOWN
16:00 <<< HOUR ENDING Monday
Summary: SMITH ST / FREDERICK ST
665 Total Light Vehicles
11 Total Heavy Vehicles
62 Total Pedestrians
Quality Surveys
223455
SMITH ST
16 28
12 11 10
30 69 39
1 2 4
1 71 0
2 110 1
3 18 0
FREDERICK ST
4
13
23
15
1 28 9
1 136 8
1 11 7
FREDERICK ST
0 0 0
46 93 14
4 5 6
TO PACIFIC HWY
N
14 7
SMITH ST
93 Light
0 Heavy
28 Pedestrians

15/3/2022 - PACIFIC HWY / FREDERICK ST, CHARLESTOWN

8:45 <<< HOUR ENDING Tuesday

Summary:	PACIFIC HWY / FREDERICK ST
2743	Total Light Vehicles
86	Total Heavy Vehicles
53	Total Pedestrians

Quality Surveys 223455

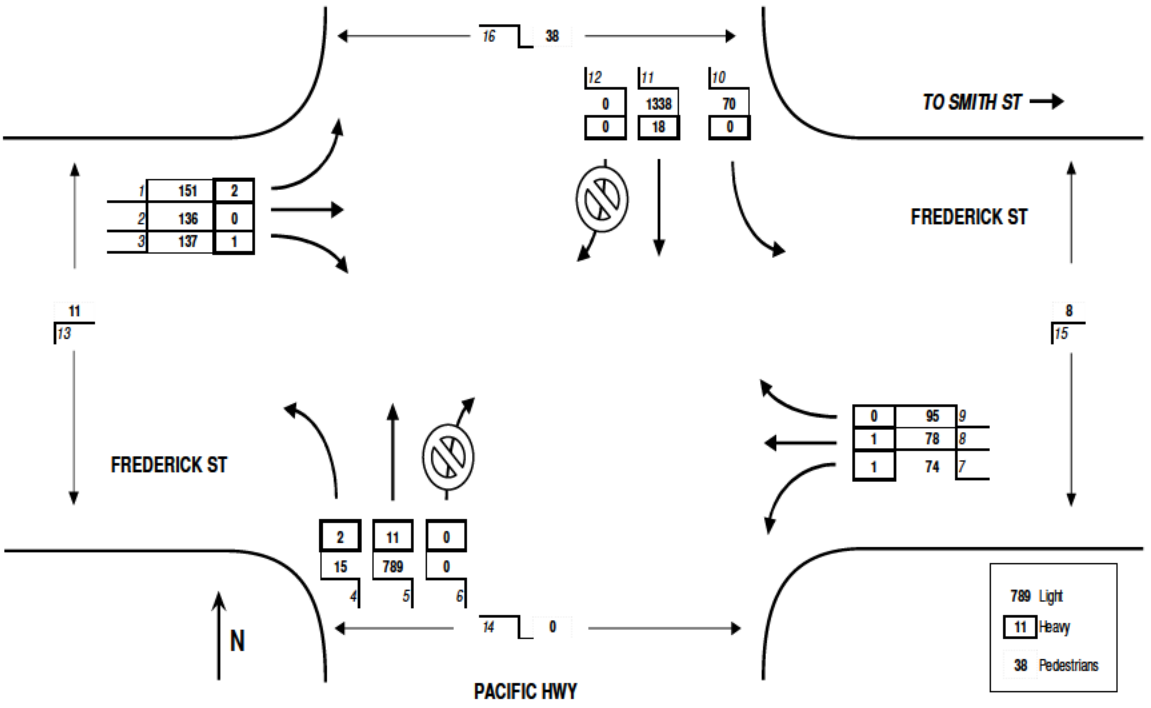


14/3/2022 - PACIFIC HWY / FREDERICK ST, CHARLESTOWN

17:30 <<< HOUR ENDING Monday

Summary:	PACIFIC HWY / FREDERICK ST
2883	Total Light Vehicles
36	Total Heavy Vehicles
57	Total Pedestrians

Quality Surveys 223455



ATTACHMENT C

Sidra movement summary tables

MOVEMENT SUMMARY

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

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2022 AM (Network Folder: General)]

Pacific Highway / Frederick Street signals Charlestown
March 2022 data
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pacific Highway															
1	L2	All MCs	11	10.0	11	10.0	0.471	10.5	LOS A	11.5	82.3	0.61	0.55	0.61	22.5
2	T1	All MCs	1592	2.6	1592	2.6	*0.471	15.9	LOS B	11.5	82.4	0.61	0.55	0.61	39.1
Approach			1602	2.7	1602	2.7	0.471	15.8	LOS B	11.5	82.4	0.61	0.55	0.61	39.0
East: Frederick Street															
4	L2	All MCs	59	1.8	59	1.8	0.364	61.8	LOS E	3.2	22.9	0.96	0.76	0.96	15.4
5	T1	All MCs	29	3.6	29	3.6	0.364	57.2	LOS E	3.2	22.9	0.96	0.76	0.96	8.0
6	R2	All MCs	107	1.0	107	1.0	*0.449	62.6	LOS E	3.9	27.9	0.97	0.78	0.97	14.1
Approach			196	1.6	196	1.6	0.449	61.5	LOS E	3.9	27.9	0.96	0.77	0.96	13.7
North: Pacific Highway															
7	L2	All MCs	102	2.1	102	2.1	0.286	11.3	LOS A	5.9	42.4	0.52	0.54	0.52	29.5
8	T1	All MCs	861	4.2	861	4.2	0.286	14.5	LOS A	6.0	43.5	0.52	0.48	0.52	40.7
Approach			963	3.9	963	3.9	0.286	14.1	LOS A	6.0	43.5	0.52	0.49	0.52	39.9
West: Frederick Street															
10	L2	All MCs	74	1.4	74	1.4	0.326	60.8	LOS E	2.7	19.0	0.95	0.76	0.95	12.3
11	T1	All MCs	97	1.1	97	1.1	*0.361	55.6	LOS D	3.5	24.5	0.95	0.75	0.95	3.9
12	R2	All MCs	46	9.1	46	9.1	0.096	56.6	LOS E	0.8	6.0	0.91	0.70	0.91	14.1
Approach			217	2.9	217	2.9	0.361	57.6	LOS E	3.5	24.5	0.94	0.74	0.94	9.5
All Vehicles			2978	3.0	2978	3.0	0.471	21.3	LOS B	11.5	82.4	0.63	0.56	0.63	33.3

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Frederick Street											
P2	Full	16	59.2	LOS E	0.1	0.1	0.95	0.95	213.0	200.0	0.94
North: Pacific Highway											
P3	Full	34	59.2	LOS E	0.1	0.1	0.96	0.96	213.1	200.0	0.94

MOVEMENT SUMMARY

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

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2022 PM (Network Folder: General)]

Pacific Highway / Frederick Street signals Charlestown
March 2022 data
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pacific Highway															
1	L2	All MCs	18	11.8	18	11.8	0.307	12.5	LOS A	6.6	46.9	0.65	0.57	0.65	20.2
2	T1	All MCs	842	1.4	842	1.4	0.307	21.7	LOS B	6.6	47.0	0.65	0.56	0.65	34.8
Approach			860	1.6	860	1.6	0.307	21.6	LOS B	6.6	47.0	0.65	0.56	0.65	34.4
East: Frederick Street															
4	L2	All MCs	79	1.3	79	1.3	0.539	71.0	LOS F	5.7	40.6	0.95	0.79	0.95	16.6
5	T1	All MCs	83	1.3	83	1.3	*0.539	66.4	LOS E	5.7	40.6	0.95	0.79	0.95	8.9
6	R2	All MCs	100	0.0	100	0.0	0.280	68.1	LOS E	3.3	23.4	0.90	0.77	0.90	15.8
Approach			262	0.8	262	0.8	0.539	68.4	LOS E	5.7	40.6	0.93	0.78	0.93	14.1
North: Pacific Highway															
7	L2	All MCs	74	0.0	74	0.0	0.535	13.7	LOS A	13.2	93.1	0.74	0.68	0.74	22.2
8	T1	All MCs	1427	1.3	1427	1.3	*0.535	25.3	LOS B	13.3	94.4	0.75	0.67	0.75	32.7
Approach			1501	1.3	1501	1.3	0.535	24.8	LOS B	13.3	94.4	0.75	0.67	0.75	32.3
West: Frederick Street															
10	L2	All MCs	161	1.3	161	1.3	*0.542	58.3	LOS E	5.9	41.4	0.97	0.81	0.97	12.7
11	T1	All MCs	143	0.0	143	0.0	0.398	50.6	LOS D	4.9	34.6	0.93	0.75	0.93	4.2
12	R2	All MCs	145	0.7	145	0.7	0.213	52.1	LOS D	2.4	17.0	0.89	0.75	0.89	15.1
Approach			449	0.7	449	0.7	0.542	53.9	LOS D	5.9	41.4	0.93	0.77	0.93	11.4
All Vehicles			3073	1.2	3073	1.2	0.542	31.9	LOS C	13.3	94.4	0.76	0.66	0.76	27.1

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Frederick Street											
P2	Full	8	59.2	LOS E	0.0	0.0	0.95	0.95	213.0	200.0	0.94
North: Pacific Highway											
P3	Full	40	59.2	LOS E	0.1	0.1	0.96	0.96	213.1	200.0	0.94

MOVEMENT SUMMARY

Site: 101 [Pacific Hwy 2022AM + Development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2022 AM + development (Network Folder: General)]

Pacific Highway / Frederick Street signals Charlestown
March 2022 data
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pacific Highway															
1	L2	All MCs	11	10.0	11	10.0	0.594	17.2	LOS B	15.0	107.8	0.79	0.71	0.79	18.5
2	T1	All MCs	1592	2.6	1592	2.6	*0.594	27.1	LOS B	15.1	107.9	0.79	0.71	0.79	31.4
Approach			1602	2.7	1602	2.7	0.594	27.0	LOS B	15.1	107.9	0.79	0.71	0.79	31.3
East: Frederick Street															
4	L2	All MCs	87	1.2	87	1.2	0.248	66.5	LOS E	3.6	25.6	0.84	0.74	0.84	18.6
5	T1	All MCs	29	3.6	29	3.6	0.248	61.9	LOS E	3.6	25.6	0.84	0.74	0.84	10.1
6	R2	All MCs	223	0.5	223	0.5	*0.598	71.0	LOS F	7.6	53.7	0.93	0.82	0.93	16.3
Approach			340	0.9	340	0.9	0.598	69.1	LOS E	7.6	53.7	0.90	0.79	0.90	16.5
North: Pacific Highway															
7	L2	All MCs	173	1.2	173	1.2	0.386	13.1	LOS A	8.4	60.2	0.68	0.69	0.68	21.8
8	T1	All MCs	861	4.2	861	4.2	0.386	26.4	LOS B	8.5	61.7	0.69	0.62	0.69	33.2
Approach			1034	3.7	1034	3.7	0.386	24.2	LOS B	8.5	61.7	0.69	0.63	0.69	31.7
West: Frederick Street															
10	L2	All MCs	74	1.4	74	1.4	0.326	60.8	LOS E	2.7	19.0	0.95	0.76	0.95	12.3
11	T1	All MCs	123	0.9	123	0.9	*0.459	56.5	LOS E	4.5	31.7	0.97	0.77	0.97	3.8
12	R2	All MCs	46	9.1	46	9.1	0.096	56.6	LOS E	0.8	6.0	0.91	0.70	0.91	14.1
Approach			243	2.6	243	2.6	0.459	57.8	LOS E	4.5	31.7	0.95	0.76	0.95	9.0
All Vehicles			3219	2.8	3219	2.8	0.598	32.9	LOS C	15.1	107.9	0.78	0.70	0.78	27.4

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Frederick Street											
P2	Full	16	59.2	LOS E	0.1	0.1	0.95	0.95	213.0	200.0	0.94
North: Pacific Highway											

MOVEMENT SUMMARY

Site: 101 [Pacific Hwy 2022PM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2022 PM + development (Network Folder: General)]

Pacific Highway / Frederick Street signals Charlestown
March 2022 data
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pacific Highway															
1	L2	All MCs	18	11.8	18	11.8	0.345	16.2	LOS B	7.3	52.0	0.71	0.62	0.71	18.6
2	T1	All MCs	842	1.4	842	1.4	0.345	26.6	LOS B	7.4	52.1	0.71	0.62	0.71	31.8
Approach			860	1.6	860	1.6	0.345	26.3	LOS B	7.4	52.1	0.71	0.62	0.71	31.5
East: Frederick Street															
4	L2	All MCs	105	1.0	105	1.0	0.554	67.4	LOS E	6.3	44.7	0.91	0.79	0.91	18.1
5	T1	All MCs	83	1.3	83	1.3	0.554	62.8	LOS E	6.3	44.7	0.91	0.79	0.91	9.8
6	R2	All MCs	209	0.0	209	0.0	*0.608	68.2	LOS E	7.2	50.1	0.93	0.81	0.93	16.5
Approach			398	0.5	398	0.5	0.608	66.8	LOS E	7.2	50.1	0.92	0.80	0.92	15.8
North: Pacific Highway															
7	L2	All MCs	140	0.0	140	0.0	0.628	14.0	LOS A	15.5	109.6	0.83	0.77	0.83	18.9
8	T1	All MCs	1427	1.3	1427	1.3	*0.628	32.7	LOS C	15.7	111.0	0.84	0.75	0.84	29.4
Approach			1567	1.2	1567	1.2	0.628	31.0	LOS C	15.7	111.0	0.84	0.76	0.84	28.6
West: Frederick Street															
10	L2	All MCs	161	1.3	161	1.3	*0.607	61.6	LOS E	6.0	42.5	0.99	0.81	0.99	12.3
11	T1	All MCs	168	0.0	168	0.0	0.520	54.6	LOS D	6.0	42.3	0.96	0.78	0.96	4.0
12	R2	All MCs	145	0.7	145	0.7	0.232	54.2	LOS D	2.5	17.4	0.91	0.75	0.91	14.7
Approach			475	0.7	475	0.7	0.607	56.8	LOS E	6.0	42.5	0.95	0.78	0.95	10.7
All Vehicles			3300	1.1	3300	1.1	0.628	37.8	LOS C	15.7	111.0	0.83	0.73	0.83	24.5

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Frederick Street											
P2	Full	8	59.2	LOS E	0.0	0.0	0.95	0.95	213.0	200.0	0.94
North: Pacific Highway											

MOVEMENT SUMMARY

Site: 101 [Pacific Hwy 2032AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2032 AM (Network Folder: General)]

Pacific Highway / Frederick Street signals Charlestown
March 2022 data
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pacific Highway															
1	L2	All MCs	12	10.0	12	10.0	0.561	11.1	LOS A	14.8	105.8	0.68	0.62	0.68	21.5
2	T1	All MCs	1847	2.6	1847	2.6	*0.561	18.3	LOS B	14.8	105.9	0.68	0.61	0.68	37.2
Approach			1859	2.7	1859	2.7	0.561	18.2	LOS B	14.8	105.9	0.68	0.61	0.68	37.1
East: Frederick Street															
4	L2	All MCs	68	1.8	68	1.8	0.399	68.4	LOS E[11]	3.7	26.5	0.96	0.77	0.96	15.5
5	T1	All MCs	34	3.6	34	3.6	0.399	63.8	LOS E[11]	3.7	26.5	0.96	0.77	0.96	8.1
6	R2	All MCs	125	1.0	125	1.0	*0.550	69.8	LOS E[11]	4.6	32.6	0.98	0.79	0.98	14.1
Approach			227	1.6	227	1.6	0.550	68.5	LOS E[11]	4.6	32.6	0.97	0.78	0.97	13.8
North: Pacific Highway															
7	L2	All MCs	118	2.1	118	2.1	0.341	11.9	LOS A	7.3	52.9	0.56	0.57	0.56	28.0
8	T1	All MCs	999	4.2	999	4.2	0.341	16.1	LOS B	7.5	54.2	0.56	0.52	0.56	39.3
Approach			1118	3.9	1118	3.9	0.341	15.7	LOS B	7.5	54.2	0.56	0.52	0.56	38.5
West: Frederick Street															
10	L2	All MCs	86	1.4	86	1.4	0.378	61.2	LOS E[11]	3.1	22.2	0.96	0.77	0.96	12.2
11	T1	All MCs	112	1.1	112	1.1	*0.397	55.0	LOS D[11]	4.0	28.4	0.95	0.76	0.95	3.9
12	R2	All MCs	54	9.1	54	9.1	0.105	55.8	LOS D[11]	0.9	6.9	0.90	0.71	0.90	14.2
Approach			252	2.9	252	2.9	0.397	57.3	LOS E[11]	4.0	28.4	0.94	0.75	0.94	9.6
All Vehicles			3456	3.0	3456	3.0	0.561	23.5	LOS B	14.8	105.9	0.68	0.60	0.68	32.1

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Frederick Street											
P2	Full	18	59.2	LOS E[12]	0.1	0.1	0.95	0.95	213.0	200.0	0.94
North: Pacific Highway											

MOVEMENT SUMMARY

Site: 101 [Pacific Hwy 2032PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2032PM (Network Folder: General)]

Pacific Highway / Frederick Street signals Charlestown
March 2022 data
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pacific Highway															
1	L2	All MCs	21	11.8	21	11.8	0.374	13.1	LOS A	8.2	58.6	0.70	0.62	0.70	19.3
2	T1	All MCs	977	1.4	977	1.4	0.374	24.5	LOS B	8.3	58.8	0.70	0.61	0.70	33.0
Approach			998	1.6	998	1.6	0.374	24.2	LOS B	8.3	58.8	0.70	0.61	0.70	32.7
East: Frederick Street															
4	L2	All MCs	92	1.3	92	1.3	0.634	76.1	LOS F[11]	6.8	47.8	0.97	0.81	0.97	16.6
5	T1	All MCs	97	1.3	97	1.3	*0.634	71.5	LOS F[11]	6.8	47.8	0.97	0.81	0.97	8.8
6	R2	All MCs	116	0.0	116	0.0	0.313	72.4	LOS F[11]	3.9	27.1	0.90	0.77	0.90	15.9
Approach			304	0.8	304	0.8	0.634	73.2	LOS F[11]	6.8	47.8	0.94	0.79	0.94	14.1
North: Pacific Highway															
7	L2	All MCs	86	0.0	86	0.0	0.651	15.2	LOS B	17.0	120.2	0.82	0.76	0.82	20.2
8	T1	All MCs	1657	1.3	1657	1.3	*0.651	29.4	LOS C	17.2	121.5	0.83	0.75	0.83	30.5
Approach			1742	1.3	1742	1.3	0.651	28.7	LOS C	17.2	121.5	0.83	0.75	0.83	30.1
West: Frederick Street															
10	L2	All MCs	187	1.3	187	1.3	*0.647	64.4	LOS E[11]	6.9	48.6	0.98	0.82	0.99	12.7
11	T1	All MCs	166	0.0	166	0.0	0.426	55.8	LOS D[11]	5.7	39.8	0.92	0.76	0.92	4.3
12	R2	All MCs	169	0.7	169	0.7	0.228	50.5	LOS D[11]	2.8	19.4	0.88	0.75	0.88	15.5
Approach			522	0.7	522	0.7	0.647	57.2	LOS E[11]	6.9	48.6	0.93	0.78	0.93	11.6
All Vehicles			3566	1.2	3566	1.2	0.651	35.4	LOS C	17.2	121.5	0.82	0.72	0.82	26.0

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Frederick Street											
P2	Full	10	59.2	LOS E[12]	0.0	0.0	0.95	0.95	213.0	200.0	0.94
North: Pacific Highway											

MOVEMENT SUMMARY

Site: 101 [Pacific Hwy 2032AM + Development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2032 AM + development (Network Folder: General)]

Pacific Highway / Frederick Street signals Charlestown
March 2022 data
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pacific Highway															
1	L2	All MCs	12	10.0	12	10.0	0.713	18.6	LOS B	19.2	137.5	0.87	0.79	0.87	17.5
2	T1	All MCs	1847	2.6	1847	2.6	*0.713	30.6	LOS C	19.2	137.7	0.87	0.79	0.87	29.6
Approach			1859	2.7	1859	2.7	0.713	30.5	LOS C	19.2	137.7	0.87	0.79	0.87	29.5
East: Frederick Street															
4	L2	All MCs	101	1.2	101	1.2	0.340	70.5	LOS E[11]	4.3	30.3	0.86	0.75	0.86	18.5
5	T1	All MCs	34	3.6	34	3.6	0.340	65.9	LOS E[11]	4.3	30.3	0.86	0.75	0.86	10.1
6	R2	All MCs	259	0.5	259	0.5	*0.697	76.0	LOS F[11]	9.2	64.6	0.96	0.84	0.98	16.1
Approach			395	0.9	395	0.9	0.697	73.7	LOS F[11]	9.2	64.6	0.92	0.81	0.93	16.3
North: Pacific Highway															
7	L2	All MCs	200	1.2	200	1.2	0.463	13.9	LOS A	10.5	74.9	0.73	0.72	0.73	20.6
8	T1	All MCs	999	4.2	999	4.2	0.463	29.1	LOS C	10.6	76.6	0.74	0.66	0.74	31.8
Approach			1200	3.7	1200	3.7	0.463	26.6	LOS B	10.6	76.6	0.74	0.67	0.74	30.3
West: Frederick Street															
10	L2	All MCs	86	1.4	86	1.4	0.378	61.2	LOS E[11]	3.1	22.2	0.96	0.77	0.96	12.2
11	T1	All MCs	143	0.9	143	0.9	*0.504	56.1	LOS D[11]	5.2	36.8	0.97	0.78	0.97	3.9
12	R2	All MCs	54	9.1	54	9.1	0.105	55.8	LOS D[11]	0.9	6.9	0.90	0.71	0.90	14.2
Approach			282	2.6	282	2.6	0.504	57.6	LOS E[11]	5.2	36.8	0.95	0.76	0.95	9.0
All Vehicles			3736	2.8	3736	2.8	0.713	35.9	LOS C	19.2	137.7	0.84	0.75	0.84	26.2

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Frederick Street											
P2	Full	18	59.2	LOS E[12]	0.1	0.1	0.95	0.95	213.0	200.0	0.94

MOVEMENT SUMMARY

Site: 101 [Pacific Hwy 2032PM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2032 PM + development (Network Folder: General)]

Pacific Highway / Frederick Street signals Charlestown
March 2022 data
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pacific Highway															
1	L2	All MCs	21	11.8	21	11.8	0.416	16.6	LOS B	9.0	63.9	0.76	0.66	0.76	17.9
2	T1	All MCs	977	1.4	977	1.4	0.416	28.9	LOS C	9.0	64.0	0.76	0.66	0.76	30.6
Approach			998	1.6	998	1.6	0.416	28.6	LOS C	9.0	64.0	0.76	0.66	0.76	30.3
East: Frederick Street															
4	L2	All MCs	122	1.0	122	1.0	0.696	75.2	LOS F[11]	7.8	55.2	0.96	0.84	0.99	17.4
5	T1	All MCs	97	1.3	97	1.3	0.696	70.7	LOS F[11]	7.8	55.2	0.96	0.84	0.99	9.3
6	R2	All MCs	243	0.0	243	0.0	*0.748	77.7	LOS F[11]	9.0	63.2	0.97	0.87	1.05	15.5
Approach			462	0.5	462	0.5	0.748	75.6	LOS F[11]	9.0	63.2	0.97	0.85	1.02	14.9
North: Pacific Highway															
7	L2	All MCs	162	0.0	162	0.0	0.756	15.6	LOS B	19.8	139.6	0.91	0.84	0.91	17.5
8	T1	All MCs	1657	1.3	1657	1.3	*0.756	36.7	LOS C	19.9	140.9	0.92	0.83	0.92	27.6
Approach			1819	1.2	1819	1.2	0.756	34.8	LOS C	19.9	140.9	0.92	0.83	0.92	26.9
West: Frederick Street															
10	L2	All MCs	187	1.3	187	1.3	*0.726	69.6	LOS E[11]	7.2	51.0	1.00	0.86	1.07	12.1
11	T1	All MCs	195	0.0	195	0.0	0.631	60.9	LOS E[11]	7.1	49.6	0.98	0.81	0.98	4.0
12	R2	All MCs	169	0.7	169	0.7	0.247	52.5	LOS D[11]	2.8	19.9	0.90	0.76	0.90	15.1
Approach			551	0.7	551	0.7	0.726	61.3	LOS E[11]	7.2	51.0	0.96	0.81	0.98	10.7
All Vehicles			3830	1.1	3830	1.1	0.756	41.9	LOS C	19.9	140.9	0.89	0.78	0.90	23.5

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Frederick Street											
P2	Full	10	59.2	LOS E[12]	0.0	0.0	0.95	0.95	213.0	200.0	0.94

MOVEMENT SUMMARY

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

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2022 AM (Network Folder: General)]

Frederick Street / Smith Street Give way
March 2022 counts
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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Smith Street															
1	L2	All MCs	39	0.0	39	0.0	0.252	5.3	LOS A	0.4	3.0	0.47	0.62	0.47	43.4
2	T1	All MCs	181	0.0	181	0.0	0.252	5.6	LOS A	0.4	3.0	0.47	0.62	0.47	45.6
3	R2	All MCs	15	0.0	15	0.0	0.252	6.8	LOS A	0.4	3.0	0.47	0.62	0.47	45.2
Approach			235	0.0	235	0.0	0.252	5.6	LOS A	0.4	3.0	0.47	0.62	0.47	45.4
East: Frederick Street															
4	L2	All MCs	22	9.5	22	9.5	0.153	4.6	LOS A	0.2	1.7	0.18	0.23	0.18	47.3
5	T1	All MCs	189	1.1	189	1.1	0.153	0.0	LOS A	0.2	1.7	0.18	0.23	0.18	47.3
6	R2	All MCs	63	1.7	63	1.7	0.153	6.2	LOS A	0.2	1.7	0.18	0.23	0.18	47.2
Approach			275	1.9	275	1.9	0.153	1.8	NA	0.2	1.7	0.18	0.23	0.18	47.2
North: Smith Street															
7	L2	All MCs	39	8.1	39	8.1	0.105	4.9	LOS A	0.2	1.2	0.29	0.51	0.29	45.2
8	T1	All MCs	40	0.0	40	0.0	0.105	5.1	LOS A	0.2	1.2	0.29	0.51	0.29	45.6
9	R2	All MCs	24	4.3	24	4.3	0.105	7.9	LOS A	0.2	1.2	0.29	0.51	0.29	43.4
Approach			103	4.1	103	4.1	0.105	5.7	LOS A	0.2	1.2	0.29	0.51	0.29	45.2
West: Frederick Street															
10	L2	All MCs	108	0.0	108	0.0	0.104	4.6	LOS A	0.0	0.3	0.05	0.35	0.05	44.9
11	T1	All MCs	71	3.0	71	3.0	0.104	0.0	LOS A	0.0	0.3	0.05	0.35	0.05	46.7
12	R2	All MCs	13	0.0	13	0.0	0.104	6.8	LOS A	0.0	0.3	0.05	0.35	0.05	44.6
Approach			192	1.1	192	1.1	0.104	3.0	NA	0.0	0.3	0.05	0.35	0.05	45.5
All Vehicles			804	1.4	804	1.4	0.252	3.7	NA	0.4	3.0	0.25	0.41	0.25	45.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 22 April 2023 10:00:42 AM
Project: D:\Work\2022\22.028 - Charlestown Private Hospital\Sidra\TfNSW amend\Charlestown Private HospitalTfNSW amend.sip9

MOVEMENT SUMMARY

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

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2022 PM (Network Folder: General)]

Frederick Street / Smith Street Give way
March 2022 counts
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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Smith Street															
1	L2	All MCs	48	0.0	48	0.0	0.153	5.0	LOS A	0.3	1.8	0.37	0.56	0.37	43.9
2	T1	All MCs	98	0.0	98	0.0	0.153	4.9	LOS A	0.3	1.8	0.37	0.56	0.37	45.9
3	R2	All MCs	15	0.0	15	0.0	0.153	6.6	LOS A	0.3	1.8	0.37	0.56	0.37	45.4
Approach			161	0.0	161	0.0	0.153	5.1	LOS A	0.3	1.8	0.37	0.56	0.37	45.5
East: Frederick Street															
4	L2	All MCs	13	8.3	13	8.3	0.102	4.6	LOS A	0.1	0.9	0.14	0.18	0.14	47.6
5	T1	All MCs	144	0.7	144	0.7	0.102	0.0	LOS A	0.1	0.9	0.14	0.18	0.14	47.9
6	R2	All MCs	31	3.4	31	3.4	0.102	6.4	LOS A	0.1	0.9	0.14	0.18	0.14	47.5
Approach			187	1.7	187	1.7	0.102	1.4	NA	0.1	0.9	0.14	0.18	0.14	47.8
North: Smith Street															
7	L2	All MCs	45	9.3	45	9.3	0.149	5.1	LOS A	0.3	1.9	0.34	0.54	0.34	45.4
8	T1	All MCs	75	2.8	75	2.8	0.149	4.8	LOS A	0.3	1.9	0.34	0.54	0.34	45.8
9	R2	All MCs	33	3.2	33	3.2	0.149	7.0	LOS A	0.3	1.9	0.34	0.54	0.34	43.7
Approach			153	4.8	153	4.8	0.149	5.4	LOS A	0.3	1.9	0.34	0.54	0.34	45.4
West: Frederick Street															
10	L2	All MCs	75	0.0	75	0.0	0.113	4.6	LOS A	0.1	0.4	0.06	0.26	0.06	45.7
11	T1	All MCs	117	0.9	117	0.9	0.113	0.0	LOS A	0.1	0.4	0.06	0.26	0.06	47.6
12	R2	All MCs	19	0.0	19	0.0	0.113	6.1	LOS A	0.1	0.4	0.06	0.26	0.06	45.4
Approach			211	0.5	211	0.5	0.113	2.2	NA	0.1	0.4	0.06	0.26	0.06	46.7
All Vehicles			712	1.6	712	1.6	0.153	3.3	NA	0.3	1.9	0.21	0.36	0.21	46.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 22 April 2023 10:00:44 AM
Project: D:\Work\2022\22.028 - Charlestown Private Hospital\Sidra\TfNSW amend\Charlestown Private HospitalTfNSW amend.sip9

MOVEMENT SUMMARY

Site: 101 [Smith Street 2022 AM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2022 AM + development (Network Folder: General)]

Frederick Street / Smith Street Give way
March 2022 counts
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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Smith Street															
1	L2	All MCs	41	0.0	41	0.0	0.299	5.4	LOS A	0.5	3.8	0.51	0.66	0.53	42.8
2	T1	All MCs	206	0.0	206	0.0	0.299	6.2	LOS A	0.5	3.8	0.51	0.66	0.53	45.3
3	R2	All MCs	15	0.0	15	0.0	0.299	7.1	LOS A	0.5	3.8	0.51	0.66	0.53	44.9
Approach			262	0.0	262	0.0	0.299	6.2	LOS A	0.5	3.8	0.51	0.66	0.53	45.1
East: Frederick Street															
4	L2	All MCs	22	9.5	22	9.5	0.156	4.6	LOS A	0.3	1.8	0.23	0.26	0.23	47.2
5	T1	All MCs	189	1.1	189	1.1	0.156	0.0	LOS A	0.3	1.8	0.23	0.26	0.23	47.0
6	R2	All MCs	63	1.7	63	1.7	0.156	7.1	LOS A	0.3	1.8	0.23	0.26	0.23	47.1
Approach			275	1.9	275	1.9	0.156	2.0	NA	0.3	1.8	0.23	0.26	0.23	47.1
North: Smith Street															
7	L2	All MCs	39	8.1	39	8.1	0.318	4.9	LOS A	0.6	4.1	0.49	0.59	0.49	44.2
8	T1	All MCs	64	0.0	64	0.0	0.318	5.8	LOS A	0.6	4.1	0.49	0.59	0.49	44.6
9	R2	All MCs	152	0.7	152	0.7	0.318	9.0	LOS A	0.6	4.1	0.49	0.59	0.49	41.5
Approach			255	1.7	255	1.7	0.318	7.5	LOS A	0.6	4.1	0.49	0.59	0.49	43.1
West: Frederick Street															
10	L2	All MCs	191	0.0	191	0.0	0.148	4.6	LOS A	0.0	0.3	0.04	0.41	0.04	44.5
11	T1	All MCs	71	3.0	71	3.0	0.148	0.0	LOS A	0.0	0.3	0.04	0.41	0.04	46.3
12	R2	All MCs	13	0.0	13	0.0	0.148	7.0	LOS A	0.0	0.3	0.04	0.41	0.04	44.2
Approach			274	0.8	274	0.8	0.148	3.5	NA	0.0	0.3	0.04	0.41	0.04	45.0
All Vehicles			1065	1.1	1065	1.1	0.318	4.7	NA	0.6	4.1	0.31	0.48	0.32	45.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 22 April 2023 10:00:47 AM
Project: D:\Work\2022\22.028 - Charlestown Private Hospital\Sidra\TfNSW amend\Charlestown Private HospitalTfNSW amend.sip9

MOVEMENT SUMMARY

Site: 101 [Smith Street 2022 PM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2022 PM + development (Network Folder: General)]

Frederick Street / Smith Street Give way
March 2022 counts
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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Smith Street															
1	L2	All MCs	51	0.0	51	0.0	0.189	5.1	LOS A	0.3	2.2	0.41	0.57	0.41	43.6
2	T1	All MCs	121	0.0	121	0.0	0.189	5.4	LOS A	0.3	2.2	0.41	0.57	0.41	45.7
3	R2	All MCs	15	0.0	15	0.0	0.189	6.8	LOS A	0.3	2.2	0.41	0.57	0.41	45.3
Approach			186	0.0	186	0.0	0.189	5.4	LOS A	0.3	2.2	0.41	0.57	0.41	45.3
East: Frederick Street															
4	L2	All MCs	13	8.3	13	8.3	0.104	4.6	LOS A	0.1	0.9	0.17	0.20	0.17	47.5
5	T1	All MCs	144	0.7	144	0.7	0.104	0.0	LOS A	0.1	0.9	0.17	0.20	0.17	47.8
6	R2	All MCs	31	3.4	31	3.4	0.104	7.4	LOS A	0.1	0.9	0.17	0.20	0.17	47.4
Approach			187	1.7	187	1.7	0.104	1.5	NA	0.1	0.9	0.17	0.20	0.17	47.6
North: Smith Street															
7	L2	All MCs	45	9.3	45	9.3	0.326	5.2	LOS A	0.6	4.4	0.47	0.61	0.47	44.7
8	T1	All MCs	98	2.2	98	2.2	0.326	5.4	LOS A	0.6	4.4	0.47	0.61	0.47	45.1
9	R2	All MCs	153	0.7	153	0.7	0.326	7.8	LOS A	0.6	4.4	0.47	0.61	0.47	42.4
Approach			296	2.5	296	2.5	0.326	6.6	LOS A	0.6	4.4	0.47	0.61	0.47	44.0
West: Frederick Street															
10	L2	All MCs	152	0.0	152	0.0	0.154	4.6	LOS A	0.1	0.4	0.04	0.33	0.04	45.2
11	T1	All MCs	117	0.9	117	0.9	0.154	0.0	LOS A	0.1	0.4	0.04	0.33	0.04	46.9
12	R2	All MCs	19	0.0	19	0.0	0.154	6.2	LOS A	0.1	0.4	0.04	0.33	0.04	44.8
Approach			287	0.4	287	0.4	0.154	2.8	NA	0.1	0.4	0.04	0.33	0.04	45.8
All Vehicles			957	1.2	957	1.2	0.326	4.2	NA	0.6	4.4	0.27	0.44	0.27	45.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 22 April 2023 10:00:49 AM
Project: D:\Work\2022\22.028 - Charlestown Private Hospital\Sidra\TfNSW amend\Charlestown Private HospitalTfNSW amend.sip9

MOVEMENT SUMMARY

Site: 101 [Smith Street 2032 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2032 AM (Network Folder: General)]

Frederick Street / Smith Street Give way
March 2022 counts
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Smith Street															
1	L2	All MCs	45	0.0	45	0.0	0.315	5.6	LOS A	0.6	4.1	0.52	0.68	0.57	42.6
2	T1	All MCs	210	0.0	210	0.0	0.315	6.4	LOS A	0.6	4.1	0.52	0.68	0.57	45.2
3	R2	All MCs	17	0.0	17	0.0	0.315	7.6	LOS A	0.6	4.1	0.52	0.68	0.57	44.7
Approach			272	0.0	272	0.0	0.315	6.4	LOS A	0.6	4.1	0.52	0.68	0.57	44.9
East: Frederick Street															
4	L2	All MCs	26	9.5	26	9.5	0.178	4.6	LOS A	0.3	2.0	0.20	0.25	0.20	47.2
5	T1	All MCs	220	1.1	220	1.1	0.178	0.0	LOS A	0.3	2.0	0.20	0.25	0.20	47.2
6	R2	All MCs	73	1.7	73	1.7	0.178	6.6	LOS A	0.3	2.0	0.20	0.25	0.20	47.1
Approach			319	1.9	319	1.9	0.178	1.9	NA	0.3	2.0	0.20	0.25	0.20	47.2
North: Smith Street															
7	L2	All MCs	45	8.1	45	8.1	0.130	4.9	LOS A	0.2	1.6	0.33	0.52	0.33	45.0
8	T1	All MCs	46	0.0	46	0.0	0.130	5.6	LOS A	0.2	1.6	0.33	0.52	0.33	45.4
9	R2	All MCs	28	4.3	28	4.3	0.130	8.8	LOS A	0.2	1.6	0.33	0.52	0.33	43.0
Approach			120	4.1	120	4.1	0.130	6.1	LOS A	0.2	1.6	0.33	0.52	0.33	44.9
West: Frederick Street															
10	L2	All MCs	126	0.0	126	0.0	0.121	4.6	LOS A	0.1	0.4	0.06	0.36	0.06	44.9
11	T1	All MCs	82	3.0	82	3.0	0.121	0.0	LOS A	0.1	0.4	0.06	0.36	0.06	46.7
12	R2	All MCs	15	0.0	15	0.0	0.121	7.3	LOS A	0.1	0.4	0.06	0.36	0.06	44.6
Approach			222	1.1	222	1.1	0.121	3.1	NA	0.1	0.4	0.06	0.36	0.06	45.5
All Vehicles			933	1.4	933	1.4	0.315	4.0	NA	0.6	4.1	0.28	0.43	0.29	45.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 22 April 2023 10:01:15 AM
Project: D:\Work\2022\22.028 - Charlestown Private Hospital\Sidra\TfNSW amend\Charlestown Private HospitalTfNSW amend.sip9

MOVEMENT SUMMARY

Site: 101 [Smith Street 2032 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2032PM (Network Folder: General)]

Frederick Street / Smith Street Give way
March 2022 counts
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Smith Street															
1	L2	All MCs	56	0.0	56	0.0	0.187	5.1	LOS A	0.3	2.2	0.41	0.58	0.41	43.6
2	T1	All MCs	114	0.0	114	0.0	0.187	5.3	LOS A	0.3	2.2	0.41	0.58	0.41	45.7
3	R2	All MCs	17	0.0	17	0.0	0.187	7.1	LOS A	0.3	2.2	0.41	0.58	0.41	45.3
Approach			187	0.0	187	0.0	0.187	5.4	LOS A	0.3	2.2	0.41	0.58	0.41	45.3
East: Frederick Street															
4	L2	All MCs	15	8.3	15	8.3	0.120	4.6	LOS A	0.2	1.1	0.16	0.19	0.16	47.6
5	T1	All MCs	167	0.7	167	0.7	0.120	0.0	LOS A	0.2	1.1	0.16	0.19	0.16	47.8
6	R2	All MCs	35	3.4	35	3.4	0.120	6.9	LOS A	0.2	1.1	0.16	0.19	0.16	47.4
Approach			217	1.7	217	1.7	0.120	1.4	NA	0.2	1.1	0.16	0.19	0.16	47.7
North: Smith Street															
7	L2	All MCs	53	9.3	53	9.3	0.183	5.2	LOS A	0.3	2.3	0.39	0.55	0.39	45.2
8	T1	All MCs	87	2.8	87	2.8	0.183	5.2	LOS A	0.3	2.3	0.39	0.55	0.39	45.6
9	R2	All MCs	38	3.2	38	3.2	0.183	7.6	LOS A	0.3	2.3	0.39	0.55	0.39	43.3
Approach			177	4.8	177	4.8	0.183	5.7	LOS A	0.3	2.3	0.39	0.55	0.39	45.2
West: Frederick Street															
10	L2	All MCs	87	0.0	87	0.0	0.131	4.6	LOS A	0.1	0.5	0.06	0.26	0.06	45.7
11	T1	All MCs	136	0.9	136	0.9	0.131	0.0	LOS A	0.1	0.5	0.06	0.26	0.06	47.5
12	R2	All MCs	22	0.0	22	0.0	0.131	6.5	LOS A	0.1	0.5	0.06	0.26	0.06	45.4
Approach			244	0.5	244	0.5	0.131	2.2	NA	0.1	0.5	0.06	0.26	0.06	46.7
All Vehicles			826	1.6	826	1.6	0.187	3.5	NA	0.3	2.3	0.24	0.38	0.24	46.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 22 April 2023 10:01:24 AM
Project: D:\Work\2022\22.028 - Charlestown Private Hospital\Sidra\TfNSW amend\Charlestown Private HospitalTfNSW amend.sip9

MOVEMENT SUMMARY

Site: 101 [Smith Street 2032 AM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2032 AM + development (Network Folder: General)]

Frederick Street / Smith Street Give way
March 2022 counts
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Smith Street															
1	L2	All MCs	48	0.0	48	0.0	0.384	6.1	LOS A	0.8	5.8	0.58	0.76	0.72	41.6
2	T1	All MCs	239	0.0	239	0.0	0.384	7.6	LOS A	0.8	5.8	0.58	0.76	0.72	44.6
3	R2	All MCs	17	0.0	17	0.0	0.384	8.4	LOS A	0.8	5.8	0.58	0.76	0.72	44.2
Approach			304	0.0	304	0.0	0.384	7.4	LOS A	0.8	5.8	0.58	0.76	0.72	44.3
East: Frederick Street															
4	L2	All MCs	26	9.5	26	9.5	0.196	4.6	LOS A	0.3	2.3	0.26	0.29	0.26	47.1
5	T1	All MCs	220	1.1	220	1.1	0.196	0.0	LOS A	0.3	2.3	0.26	0.29	0.26	46.9
6	R2	All MCs	73	1.7	73	1.7	0.196	7.8	LOS A	0.3	2.3	0.26	0.29	0.26	47.0
Approach			319	1.9	319	1.9	0.196	2.2	NA	0.3	2.3	0.26	0.29	0.26	47.0
North: Smith Street															
7	L2	All MCs	45	8.1	45	8.1	0.434	6.1	LOS A	1.1	8.0	0.60	0.71	0.78	43.0
8	T1	All MCs	75	0.0	75	0.0	0.434	7.8	LOS A	1.1	8.0	0.60	0.71	0.78	43.3
9	R2	All MCs	176	0.7	176	0.7	0.434	11.7	LOS A	1.1	8.0	0.60	0.71	0.78	39.4
Approach			296	1.7	296	1.7	0.434	9.9	LOS A	1.1	8.0	0.60	0.71	0.78	41.5
West: Frederick Street															
10	L2	All MCs	221	0.0	221	0.0	0.172	4.6	LOS A	0.1	0.4	0.04	0.41	0.04	44.5
11	T1	All MCs	82	3.0	82	3.0	0.172	0.0	LOS A	0.1	0.4	0.04	0.41	0.04	46.3
12	R2	All MCs	15	0.0	15	0.0	0.172	7.5	LOS A	0.1	0.4	0.04	0.41	0.04	44.2
Approach			318	0.8	318	0.8	0.172	3.5	NA	0.1	0.4	0.04	0.41	0.04	45.0
All Vehicles			1236	1.1	1236	1.1	0.434	5.6	NA	1.1	8.0	0.36	0.53	0.44	44.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 22 April 2023 10:00:58 AM
Project: D:\Work\2022\22.028 - Charlestown Private Hospital\Sidra\TfNSW amend\Charlestown Private HospitalTfNSW amend.sip9

MOVEMENT SUMMARY

Site: 101 [Smith Street 2032 PM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [2032 PM + development (Network Folder: General)]

Frederick Street / Smith Street Give way
March 2022 counts
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Smith Street															
1	L2	All MCs	59	0.0	59	0.0	0.238	5.2	LOS A	0.4	2.8	0.46	0.61	0.46	43.1
2	T1	All MCs	140	0.0	140	0.0	0.238	6.0	LOS A	0.4	2.8	0.46	0.61	0.46	45.5
3	R2	All MCs	17	0.0	17	0.0	0.238	7.4	LOS A	0.4	2.8	0.46	0.61	0.46	45.0
Approach			216	0.0	216	0.0	0.238	5.9	LOS A	0.4	2.8	0.46	0.61	0.46	45.0
East: Frederick Street															
4	L2	All MCs	15	8.3	15	8.3	0.129	4.6	LOS A	0.2	1.2	0.20	0.22	0.20	47.5
5	T1	All MCs	167	0.7	167	0.7	0.129	0.0	LOS A	0.2	1.2	0.20	0.22	0.20	47.7
6	R2	All MCs	35	3.4	35	3.4	0.129	8.0	LOS A	0.2	1.2	0.20	0.22	0.20	47.3
Approach			217	1.7	217	1.7	0.129	1.6	NA	0.2	1.2	0.20	0.22	0.20	47.5
North: Smith Street															
7	L2	All MCs	53	9.3	53	9.3	0.424	6.0	LOS A	1.1	7.6	0.56	0.71	0.70	43.9
8	T1	All MCs	114	2.2	114	2.2	0.424	6.8	LOS A	1.1	7.6	0.56	0.71	0.70	44.3
9	R2	All MCs	177	0.7	177	0.7	0.424	9.5	LOS A	1.1	7.6	0.56	0.71	0.70	41.0
Approach			343	2.5	343	2.5	0.424	8.1	LOS A	1.1	7.6	0.56	0.71	0.70	43.0
West: Frederick Street															
10	L2	All MCs	176	0.0	176	0.0	0.179	4.6	LOS A	0.1	0.5	0.05	0.33	0.05	45.1
11	T1	All MCs	136	0.9	136	0.9	0.179	0.0	LOS A	0.1	0.5	0.05	0.33	0.05	46.9
12	R2	All MCs	22	0.0	22	0.0	0.179	6.6	LOS A	0.1	0.5	0.05	0.33	0.05	44.8
Approach			334	0.4	334	0.4	0.179	2.8	NA	0.1	0.5	0.05	0.33	0.05	45.8
All Vehicles			1110	1.2	1110	1.2	0.424	4.8	NA	1.1	7.6	0.31	0.48	0.36	44.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 22 April 2023 10:01:07 AM
Project: D:\Work\2022\22.028 - Charlestown Private Hospital\Sidra\TfNSW amend\Charlestown Private HospitalTfNSW amend.sip9

ATTACHMENT D

Keolis Downer Consultation

Jeff

From: Margaret Pannell <margaret.pannell@keolisdowner.com.au>
Sent: Tuesday, 18 April 2023 4:57 PM
To: Jeff; Genlot Emmanuel; Amy Saper; Nadege Larcher
Cc: Ian Gill; Gavin Rose; Wes Wilson
Subject: RE: Charlestown Private Hospital - 33 Smith Street, Charlestown

Hi Jeff

Just confirming Keolis Downer are happy to support the installation of a bus stop on Smith St Charlestown, north of Frederick St.

This stop will be used by service route 48.

Please keep us informed.

Thanks

Marg

From: Jeff <jeff@intersecttraffic.com.au>
Sent: Tuesday, April 18, 2023 11:35 AM
To: Margaret Pannell <margaret.pannell@keolisdowner.com.au>
Cc: Ian Gill <ian.gill@archadia.com.au>; Gavin Rose <gavin.rose@gpvproperty.com.au>; Wes Wilson <wesley@wilsonplanning.com.au>
Subject: Charlestown Private Hospital - 33 Smith Street, Charlestown

Margaret,

Thank you for taking my call this morning and discussing the issue of bus stops in the vicinity of a proposed private hospital on the old Charlestown Public School site between the Pacific Highway and Smith Street immediately north of Frederick Street (33 Smith Street).

After discussing this with you and in particular considering the use of existing services and nearby bus stops I believe the best location for a bus stop to service the hospital that does not require adjustment to an existing bus route is for the installation of a bus stop on the Smith Street frontage of the site (western side) immediately north of Frederick Street. This would be opposite to and in close vicinity of the existing bus stop in front of the new Charlestown Public School.

Can I confirm that Keolis Downer would support the installation of a new bus stop in this location.

Thanking you for your time.

Regards

Jeff Garry
Director