

# Taronga Zoo

Redeveloped Upper Australia Exhibit  
Transport Impact Assessment

Prepared by: GTA Consultants (NSW) Pty Ltd for Taronga Conservation Society Australia

on 21/07/2020

Reference: N192210

Issue #: B

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### Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	16/07/2020	Final	Andrew Zhou Ashish Modessa	Ashish Modessa	Kane Williams	Kane Williams
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# 1. INTRODUCTION

01

## INTRODUCTION

### 1.1. Background

The “Upper Australia” project involves the redevelopment of an existing exhibit into a new exhibit for Taronga Zoo visitors.

It is understood that a traffic and transport report is required to accompany an Environmental Impact Statement (EIS) for the State Significant Development (SSD-10456).

Taronga Conservation Society Australia commissioned GTA Consultants (GTA) to undertake a transport impact assessment for the proposal.

The location of the Upper Australia exhibit is presented in Figure 1.1.

Figure 1.1: Site location



Source: GTA Consultants, basemap Nearmap, June 2020

### 1.2. Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposal during operation and construction stages, including consideration of the following:

- i. existing traffic and parking conditions at the site
- ii. suitability of the proposed parking in terms of supply (quantum)
- iii. pedestrian and bicycle requirements
- iv. the traffic generating characteristics of the proposal
- v. the transport impact of the proposal on the surrounding road network
- vi. construction traffic impact during the construction stages.

## INTRODUCTION

This report addresses the NSW Department of Planning, Industry and Environment – (DPIE) requirements for transport impact that are included in the Secretary's Environmental Access Requirements (SEARs) – Schedule 2 of the Environmental Planning and Assessment Regulation 2000, as referenced in Table 1.1.

**Table 1.1: SEARs requirements**

Item #	Item	Reference
Include a transport and accessibility impact assessment, which details, but not limited to the following:		
1	Detailed assessment of the existing and future key intersections providing access to the site, supported by appropriate modelling and analysis to include: <ul style="list-style-type: none"> <li>• Whiting Beach Rd at Prince Albert St.</li> <li>• Whiting Beach Rd at Bradleys Head Rd.</li> </ul>	Section 5.3
2	Measures to mitigate impacts of the proposed development on the capacity and operation of existing and future traffic, public transport, pedestrian and bicycle networks, including any required upgrades.	Section 5.3, Section 7.1
3	Preparation of a Green Travel Plan (GTP) in consultation with TfNSW.	Section 7.4
4	Details of existing and proposed vehicle access arrangements, including parking, pedestrian safety management, loading dock and servicing management with consideration of precinct wide shared loading docks and/ or remote or off-site loading zone hub facilities, ensuring all servicing and loading occurs on-site and does not rely on kerbside controls.	Section 4.2, Section 7.1, Section 7.3
5	An assessment of pedestrian and cyclist safety with consideration of the relationship with design, access, and operation of the development.	Section 7.1
6	The preparation of a preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) to demonstrate the proposed management of the impact in relation to construction traffic addressing the following: <ul style="list-style-type: none"> <li>• Assessment of cumulative impacts associated with other construction activities (if any).</li> <li>• An assessment of road safety at key intersection and critical locations subject to heavy vehicle construction traffic movements and high pedestrian activity.</li> <li>• Details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process.</li> <li>• Details of anticipated peak hour and daily construction vehicle movements to and from the site.</li> <li>• Details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle.</li> <li>• Details of temporary cycling and pedestrian arrangement during construction.</li> <li>• Measures to mitigate the impacts of construction activities on other road users.</li> </ul>	Chapter 6
7	The parking and traffic impacts of the proposed development should take into account the impacts associated with the construction of the proposed exhibit and associated facilities. This should include the potential overlap of other construction projects being undertaken at the zoo at the same time, if applicable.	Section 6.6.1, Section 6.6.2

## INTRODUCTION

This report has been prepared in consultation with Transport for NSW through upfront liaison. Specifically, this relates to traffic surveys and intersection modelling of the adjacent intersections as well as the requirement for a Green Travel Plan (GTP). Feedback was received on 25 June 2020 advising the following:

- Traffic surveys and modelling should be undertaken with appropriate assumptions made to represent typical conditions.
- An overview GTP is appropriate for this Transport Impact Assessment and that the development of a detailed GTP would be conditioned for issue prior to receipt of Occupation Certificate.

The correspondence is included in Appendix A.

### 1.3. References

In preparing this report, the following documents have been reviewed and where appropriate reference has been made to the following:

- Mosman Council Open Space and Infrastructure Development Control Plan (DCP) 2012 – Amended 2018
- Mosman Council Business Centres Development Control Plan (DCP) 2012 – Amended 2018
- Mosman Municipal Council Local Environmental Plan (LEP) 2012
- Transport for NSW (TfNSW) Guide to Traffic Generating Development
- Transport for NSW Traffic Control at Work Site manual
- NSW Planning Guidelines for Walking and Cycling
- site layout plans prepared by Lahznimmo Architects
- other documents and data as referenced in this report.

## 2. EXISTING CONDITIONS

02

## EXISTING CONDITIONS

### 2.1. Location

Taronga Zoo is located west of Bradleys Head Road, Mosman and it bound by Whiting Beach Road to the north, Athol Wharf Road to the south and Little Sirius Cove to the west. The location of the zoo and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject site and its environs



Base source: Sydway Publishing Pty Ltd

### 2.2. Road Network

#### Bradleys Head Road

Bradleys Head Road functions as a local collector road and is aligned in a north-south direction linking the area with Military Road and Spit Junction in the heart of Mosman. At the entrance of the zoo, it is a two-way road configured with a two-lane, nine-metre wide carriageway, including a right turn lane to access the Taronga Zoo multistorey and at-grade car parks.

Kerbside parking is permitted north of the site entrance and angled parking spaces are marked south of entrance.

## EXISTING CONDITIONS

### Whiting Beach Road

Whiting Beach Road is a local road and near the site is aligned in an east-west direction. It is a two-way road configured with a two-lane, eight-metre wide carriageway. Whiting Beach Road provides staff and delivery access to Taronga Zoo car parking and the back-of-house area of the zoo via the northern access.

Unrestricted kerbside parking is permitted on the northern side of the road.

### 2.3. Car Parking

Table 2.1 provides a breakdown of the location and type of parking spaces provided on-site within Taronga Zoo.

Table 2.1: Summary of on-site parking supply

Location	General car spaces	Accessible car spaces	Motorcycle spaces	Total
Multistorey	639	14	12	665
Overflow area	176	5	-	181
<b>Total</b>	<b>815</b>	<b>19</b>	<b>12</b>	<b>846</b>

It is noted that the overflow parking area is typically made available once the multistorey car park approaches its capacity. The total car park capacity including the multistorey car park and overflow area is 834 spaces, with a further 12 motorcycle spaces.

Historical car park occupancy data has been provided by Taronga Zoo showing typical parking usage throughout the year. Figure 2.2 presents the peak daily parking occupancy profile over about a two-year period, which would represent typical demand in any year.

A summary of the historical parking data is provided below:

- The parking data has been collected for a total of 653 days.
- Over the duration of 653 days, parking occupancy exceeded the total car park capacity for only 10 days within the survey period.
- On average, the parking demand exceeds the total car park capacity five to six days per year.
- The 85<sup>th</sup> percentile peak parking occupancy is 618 spaces. In simple terms, for 85 per cent of the times, the parking demand is less than 618 spaces. This equates to a minimum of 216 available car parking spaces.

## EXISTING CONDITIONS

Figure 2.2: Peak daily car park occupancy

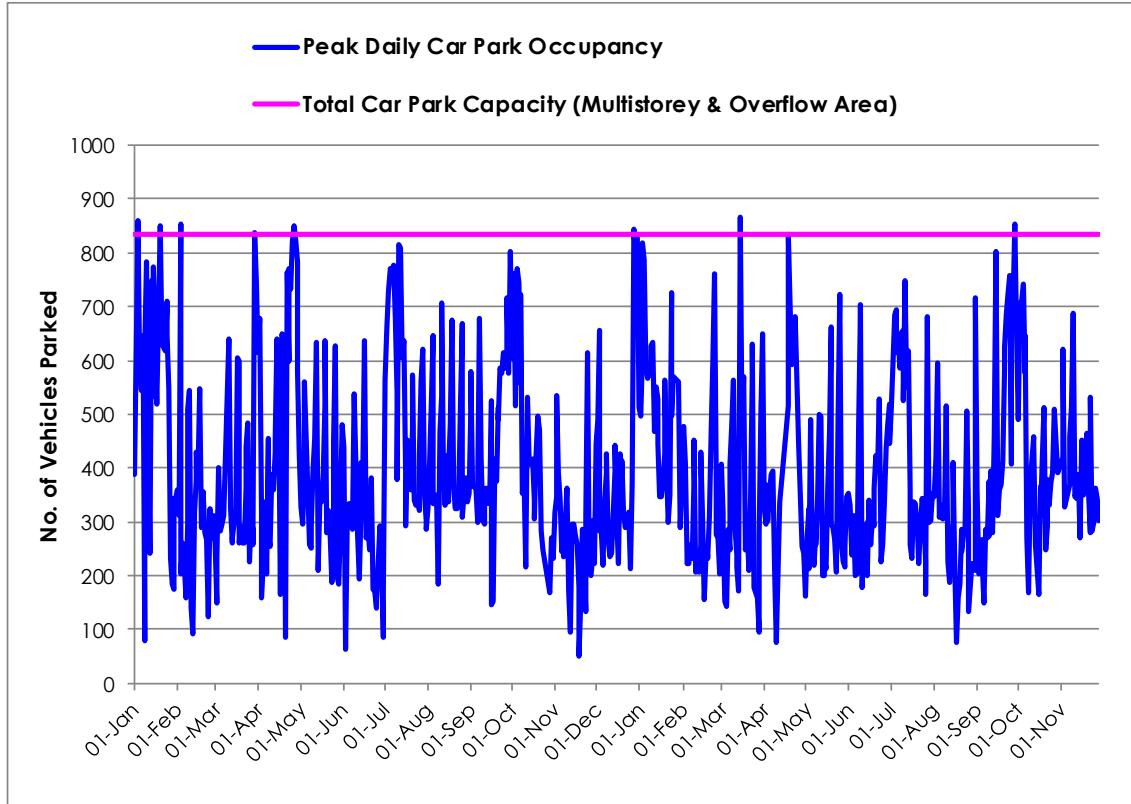
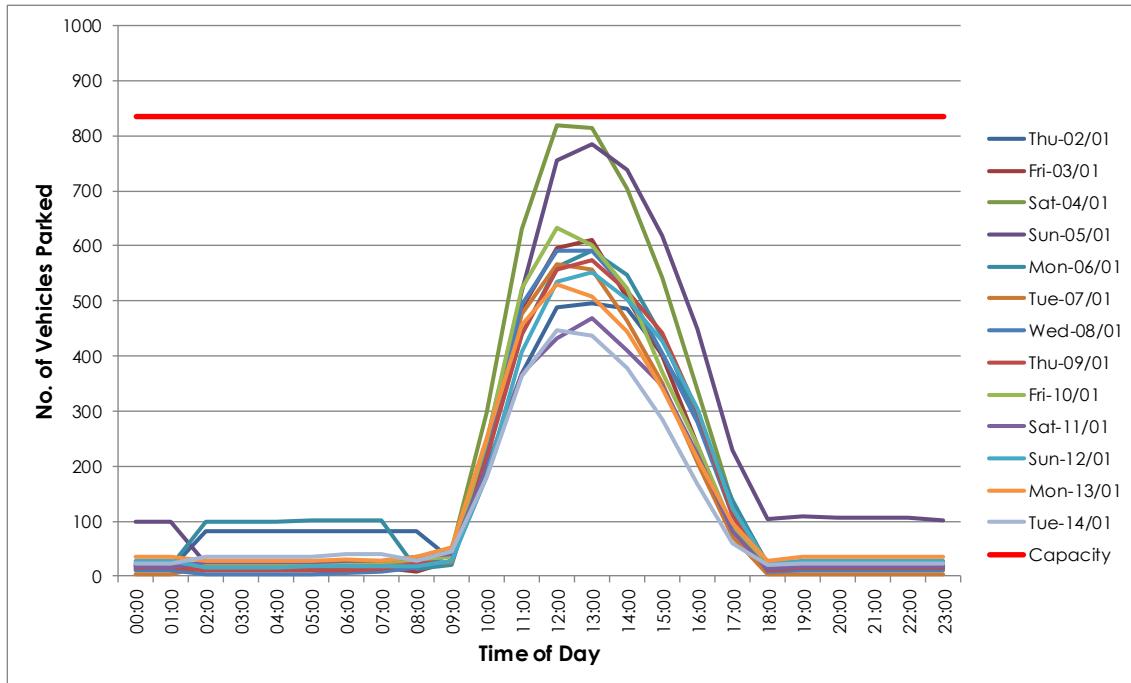


Figure 2.3 also presents historical hourly parking occupancy profile over the first two weeks for a typical January.

Figure 2.3: Hourly parking occupancy (first two weeks in January)



## EXISTING CONDITIONS

Figure 2.3 indicates that peak parking occupancy generally occurred between 12:00pm and 1:00pm and the parking occupancy decreases significantly after 2:00pm.

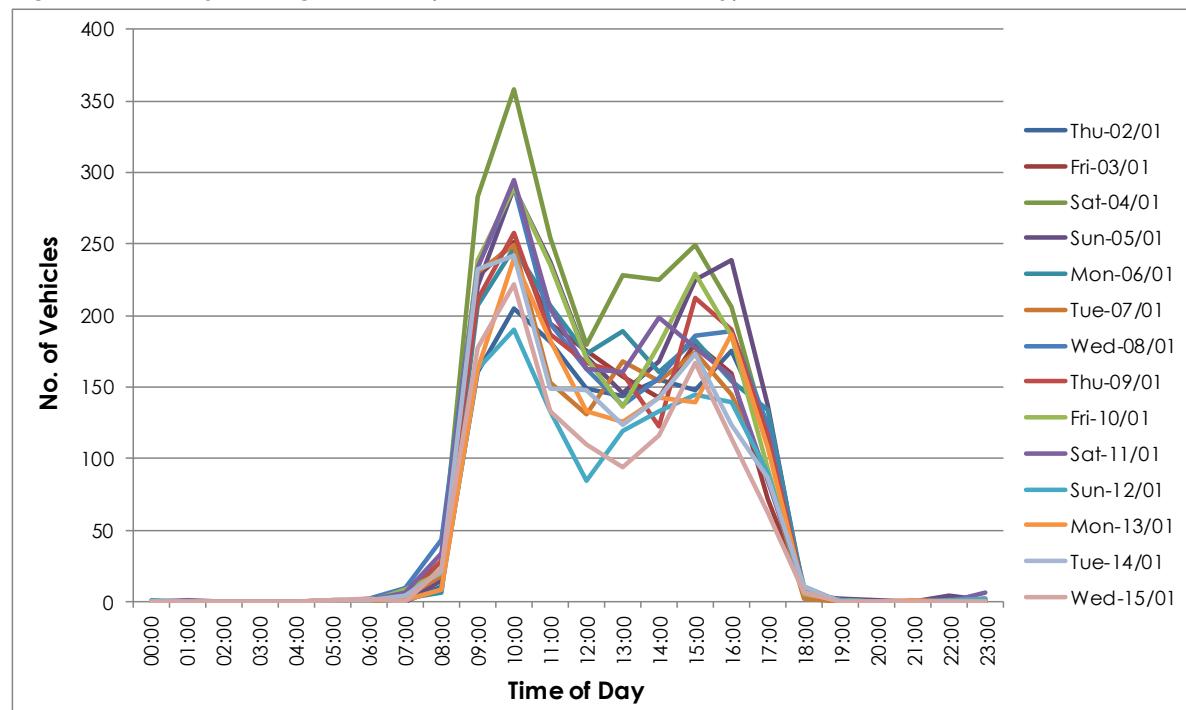
### 2.4. Traffic Generation

The traffic generation of the Taronga Zoo can be estimated from the number of vehicles entering and exiting the multistorey car park. Figure 2.4 presents historical hourly traffic generation (i.e. sum of total vehicles entering and exiting the car park) profile over the first two weeks in January.

A summary of the historical hourly traffic generation is provided below:

- weekday peak hour traffic generation of the zoo was 290 vehicles per hour, which occurred at 10:00am to 11:00am
- weekend peak hour traffic generation was 358 vehicles per hour, which occurred at 10:00am to 11:00am
- the majority of vehicles entered the car park between 9:00am and 12:00pm
- profile of vehicles exiting the car park was more spread out i.e. between 1:00pm and 6:00pm
- during the traffic network peak hour, the zoo generates in average of 20 vehicles (between 8:00am to 9:00am) and 100 vehicles (between 5:00pm to 6:00pm)
- average daily traffic generation is approximately 1,550 and 1,900 vehicles during the weekdays and weekends, respectively.

Figure 2.4: Hourly traffic generation (first two weeks in January)



## 2.5. Public Transport

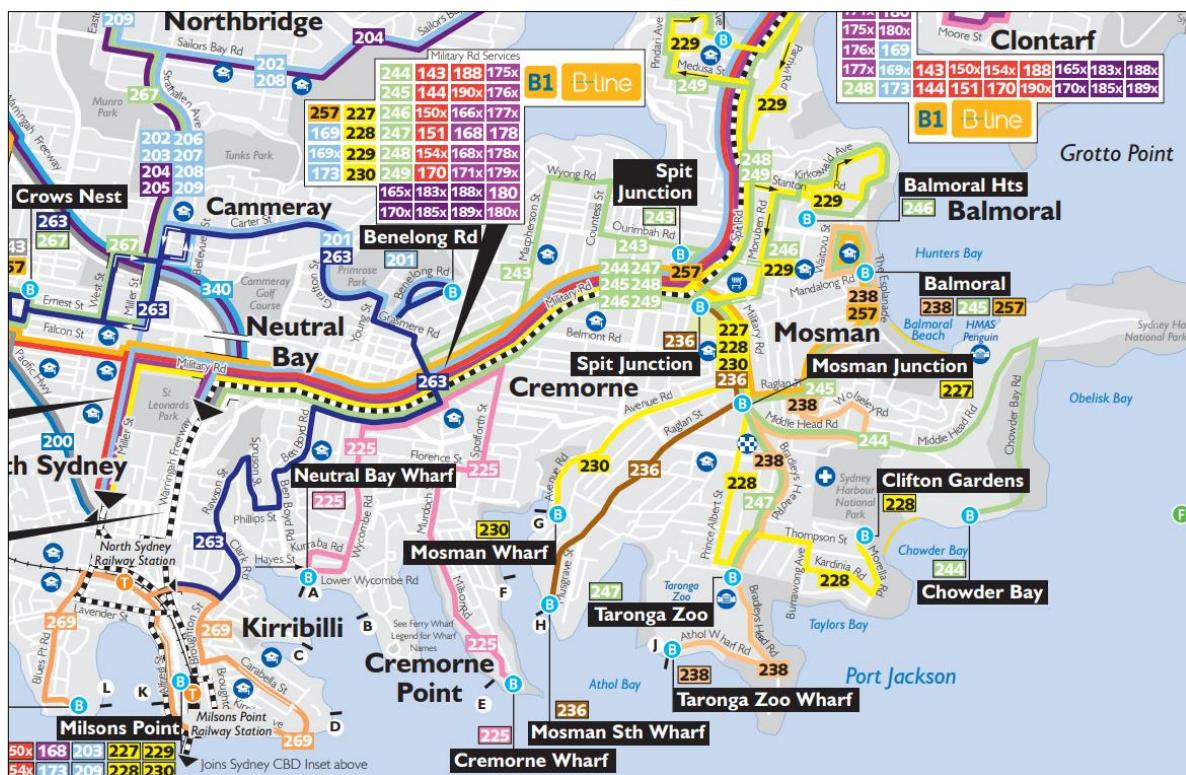
The site is accessible by bus and ferry. Bus stops are located at the main entrance off Bradleys Head Road and ferry wharf is located at southern entrance of the zoo.

A review of the public transport available in the vicinity of the site is summarised in Table 2.2 and a bus route map is provided in Figure 2.5.

Table 2.2: Public transport provision

Service	Route #	Route description	Location of stop	Distance to nearest stop	Frequency on/off peak
Bus	228	Milsons Point to Clifton Gardens	Bradleys Head Road	100 m	4 services per peak per direction
Bus	238	Balmoral Beach to Taronga Zoo	Taronga Zoo	on site	30 minutes peak and off peak
Bus	247	City to Taronga Zoo	Taronga Zoo	on site	30 minutes off peak
Bus	430	Sydenham to Taronga Zoo	Taronga Zoo	on site	10 minutes peak and 15 minutes off peak
Ferry	F2	Circular Quay to Taronga Zoo	Taronga Zoo Wharf	on site	30 minutes peak and off peak

Figure 2.5: Sydney bus network map



Source: <https://transportnsw.info/travel-info/ways-to-get-around/bus/bus-operator-maps> accessed 18/05/2020

### 2.6. Pedestrian and Cycle Infrastructure

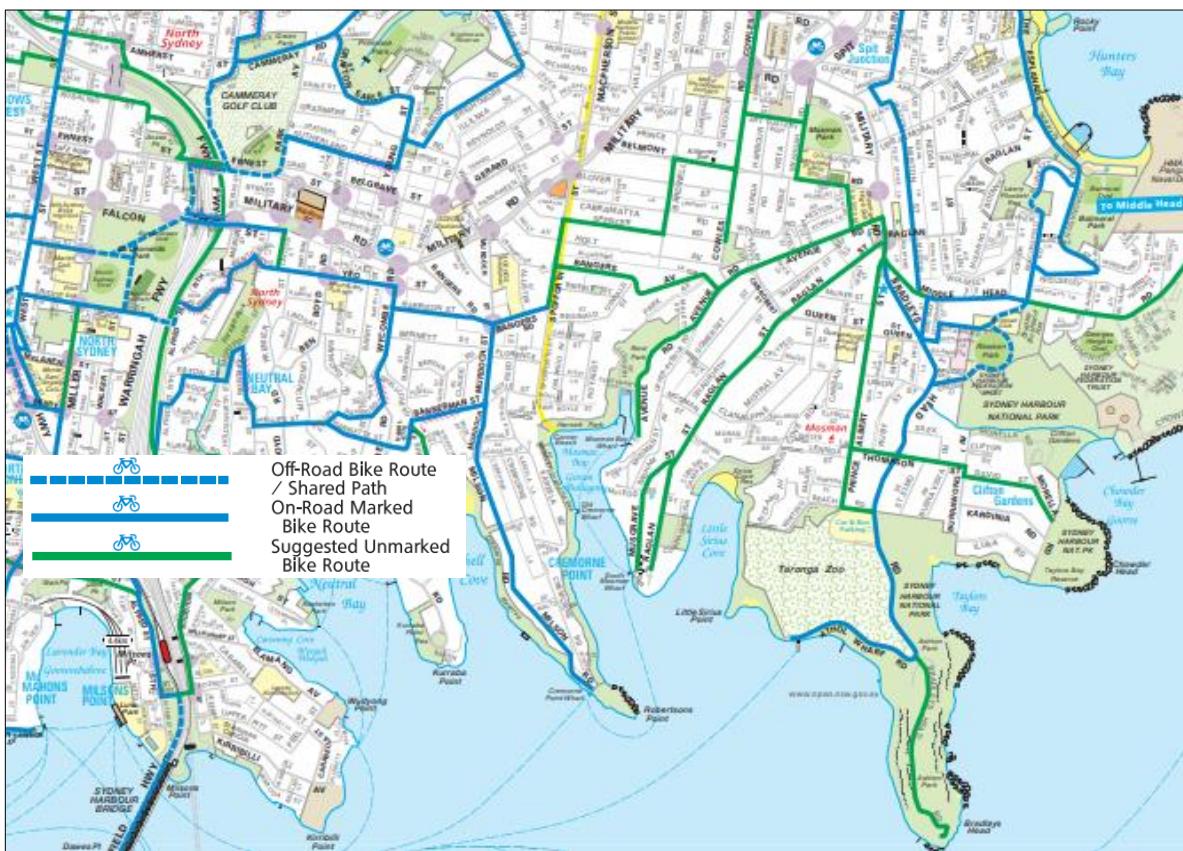
Pedestrian footpaths are provided at the following locations:

- Both sides of Bradleys Head Road, north of the main zoo entrance.
- Both sides of Bradleys Head Road, south of the main zoo entrance for approximately 300 metres.
- Northern side of Whiting Beach Road.

A safe pedestrian crossing point is provided across the Bradleys Head Road, at the main entrance.

The nearest cycle route in vicinity of the site runs along the Bradleys Head Road-Athol Wharf Road. The cycle network surrounding the subject site is illustrated in Figure 2.6, which shows the site has a good connectivity to on/ off street cycle routes.

Figure 2.6: Mosman cycle map



Source: <https://mosman.nsw.gov.au/recreation/cycling> accessed 19/05/20

### 2.7. Travel Behaviour

The site is generally well serviced by established and frequent public transport services. Based on available information and historical data from the zoo, approximately 60 per cent of zoo visitors travel to and from the zoo by ferry or bus, with the remaining 40 per cent using private vehicles.

## 3. DEVELOPMENT PROPOSAL

03

## DEVELOPMENT PROPOSAL

The project involves the redevelopment the existing Upper Australia exhibit. This will upgrade star attractions including kangaroo, koala, platypus, wombat and emu exhibits. The proposal includes the following works:

- refurbishment of the existing nocturnal house
- construction of a new koala encounter and canopy walk
- extension of the existing macropod walkthrough
- creation of a new eastern plaza and western pavilion
- upgrades to back of house facilities for animal care
- additional toilets and amenities for staff and visitors
- other supporting infrastructure and walkways
- modifications to the existing ropes course including a new entrance.

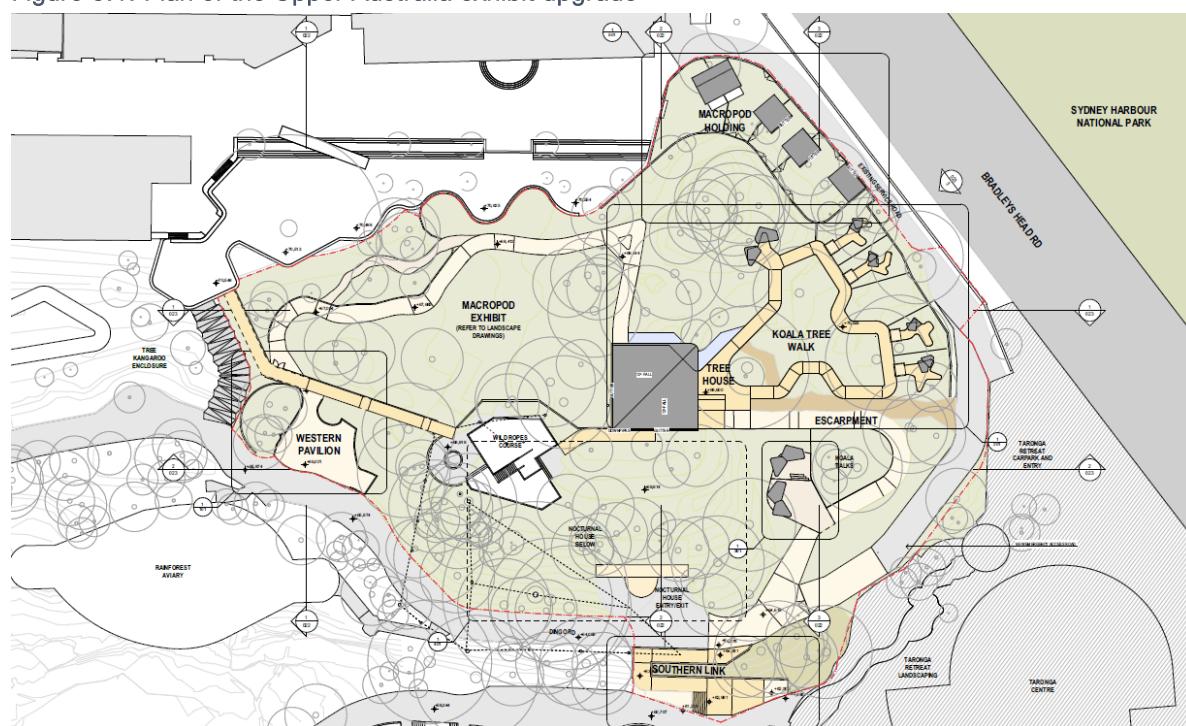
The redevelopment aims to improve an existing exhibit and will not include an increase in the use of the site.

Accordingly, it is anticipated that visitation resultant to this proposal will be largely consistent with the historical circumstances, except for the first few weeks of an exhibit opening where there may be an increase in local visitor volumes. No additional car parking will be provided as part of this proposal.

It is proposed that all deliveries to and from the redeveloped exhibit will be provided via the Whiting Beach Road access through the security portal.

Figure 3.1 shows the site layout of the proposed Upper Australia exhibit, with swept path analysis that was completed to verify the design can accommodate relevant design vehicles with further detailed design included in Appendix B.

**Figure 3.1: Plan of the Upper Australia exhibit upgrade**



Source: Lahznimmo Architects drawing no A-DA-021 Revision 2, dated 15 June 2020

## 4. CAR PARKING

04

### 4.1. Car Parking Requirements

Mosman Council's Open Space and Infrastructure Development Control Plan (DCP) 2012 and Business Centres Development Control Plan (DCP) 2012 does not specify a car parking rate for zoos or similar uses. Similarly, the Roads and Maritime Guide to Traffic Generating Developments does not specify a parking rate for the proposed uses. Notwithstanding, it is reiterated that the proposal involves an upgrade of an existing exhibit.

The site area for the zoo will not increase to upgrade the exhibits and therefore would not intensify the existing visitation numbers. Therefore, the proposal will not be required to provide any additional on-site car parking.

### 4.2. Adequacy of Parking Supply

As presented in Section 2.3, Taronga Zoo currently provides in total of 834 car parking and 12 motorcycle spaces in its multistorey and overflow parking areas.

The historical peak daily parking occupancy profile is presented in Figure 2.2. The results of the parking analysis indicate that the historical 85<sup>th</sup> percentile peak parking occupancy was 618 spaces with minimum of 216 available car parking spaces. The number of days which the parking demand exceeded the capacity was in average of five to six days over a one-year period.

Therefore, the existing multistorey car park would have some capacity to accommodate a temporary increase in parking demand during the initial weeks following the opening of the redeveloped exhibit. The increase is expected to be no more than 10 per cent and is based on previous operational experiences of the zoo. Applying the 10 percent visitation surge to the 85<sup>th</sup> percentile demand of 618 spaces equates to an additional parking demand of approximately 62 spaces. Based on the availability of 216 spaces, this temporary increase can be easily accommodated within the existing multistorey car park.

The proposed Upper Australia exhibit is not expected to generate any increase in parking demand over the long term. This is due to the fact that most of the animals that will inhabit the Upper Australia exhibit are already present in the zoo's existing exhibit. As such, the effect of any 'new' appeal is anticipated to be low.

Further, the zoo is not increasing in size. Rather, just redeveloping existing exhibits within the zoos existing property.

It is noted that the parking data provided predates the opening of the Australia Habitat and Taronga Wildlife Retreat, as such parking demand from the Retreat has not been accounted for. GTA's Transport Impact Assessment for the Australia Habitat and Taronga Wildlife Retreat<sup>1</sup> indicated that retreat guests would typically require 62 car spaces. An additional nine spaces would be required for use by staff and accommodated within the staff carpark.

Guest arrival typically occurs between 3:30pm and 5:30pm and departures between 10:00am and 11:00am. With peak parking demand generally between 12:00pm and 1:00pm and decreasing significantly after 2:00pm, the existing on-site car parking provision will be sufficient to accommodate

<sup>1</sup> Transport Impact Assessment – Taronga Zoo – Proposed Australia Habitat & Taronga Wildlife Retreat – Transport Impact Assessment, GTA Consultants, 07 March 2016

the additional demand arising from the retreat. That said, it is conservatively assessed that 50 per cent of the parking demand will occur during the peak parking occupancy period, equivalent to 31 spaces.

Considering the proposed Upper Australia exhibit's temporary surge in demand in combination with the retreat, the additional total parking demand could equate to 93 spaces. This would be able to be accommodated within the 85<sup>th</sup> percentile spare capacity of 216 spaces and is presented in Table 4.1.

**Table 4.1: Anticipated peak parking demand**

Taronga Zoo parking	Peak parking occupancy	Percentage
Total parking available	834	100%
Existing parking demand	618	74%
Wildlife Retreat parking demand	31	4%
Upper Australia Exhibit additional parking demand (initial opening)	62	7%
<b>Total anticipated peak parking demand</b>	<b>711</b>	<b>85%</b>

It is worth noting that Taronga Zoo is very conscious of the potential impacts associated with the opening of new animal facilities. As such, the zoo will ensure a 'soft' opening during non-peak periods to assist the animals in adjusting to the redeveloped exhibits. The soft opening will also allow the zoo to better manage any such surge in visitation and keep this period outside the school holiday periods. This could also align with the current health situation impacting visitation and gatherings. At the time of the soft opening, visitation to the zoo may still be impacted by social distancing measures in place following the re-opening of the zoo the near future.

Noting the above, it is believed that the current parking supply at the zoo is considered more than sufficient to accommodate any temporary surge in demand that the zoo may experience due to the opening of the redeveloped exhibit even when considering normal operating situations. Following the first few weeks of opening, visitation numbers are expected to settle and largely remain as per historic and hence, additional parking is not required.

## 5. TRAFFIC ASSESSMENT

05

### 5.1. Overview

Similar to parking demand, the proposed Upper Australia exhibit is not expected to generate additional traffic to Taronga Zoo. This is because, visitors and members generally visit the zoo for the overall experience and not just a redeveloped exhibit. As such, the opening of the redeveloped exhibit is not expected to generate additional visitation numbers.

However, it is acknowledged that during the first few weeks following the opening of the redeveloped exhibit, visitation to the zoo is likely to increase by up to about 10 per cent by additional local visitors before settling down to normal visitation numbers.

Based on the historic usage data obtained for the existing multistorey car park during the first two weeks in January (i.e. busiest period of the year), the average daily traffic generation of the zoo is approximately 1,550 and 1,900 vehicles during the weekdays and weekends, respectively. Therefore, the temporary increase in daily traffic flows during the opening periods is expected to increase to approximately by approximately 160 to 190 additional vehicles per day.

Given existing global circumstances of COVID-19, the associated traffic conditions within the roads of Sydney is considered an inaccurate representation of normal road conditions.

In addition, with the corresponding social distance measures in place, the visitation numbers to the zoo is expected to be atypical of previous, which is discussed further in the chapter. As such, the vehicular traffic since the initial re-opening of the zoo are a misrepresentation of typical Zoo traffic.

Notwithstanding, Transport for NSW has indicated during initial discussions that their preference is for traffic surveys and intersection modelling of the adjacent intersections of the zoo to be undertaken with appropriate assumptions made to represent typical conditions. Therefore, the traffic impact of the opening of the redeveloped Upper Australia exhibit has been documented in the following sections.

### 5.2. Traffic Generation

#### 5.2.1. Zoo's Weekday and Weekend Peaks

The average site peak hour traffic generation of the zoo has historically been approximately 250 and 310 vehicles during the peak period between 1:00pm and 2:00pm on weekdays and weekends, respectively. The temporary increase in traffic generation is then expected to be some 25 to 30 additional vehicles per hour during the site peak hours.

Similarly, as the traffic data also predates the opening of the Retreat, such traffic impacts associated with the Retreat must also be considered. Based on GTA's Transport Impact Assessment<sup>2</sup>, the Australia Habitat and Taronga Wildlife Retreat is expected to generate up to 25 vehicle trips per hour during the busiest peak. However, available information (i.e. historical knowledge of Roar and Snore) indicates that guest arrivals and departures typically fall outside of the traffic peak periods. As discussed, it is anticipated that retreat guest arrivals will typically occur between 3:30pm and 5:30pm, with departures between 10:00am and 11:00am. Based on this, a conservative approach was adopted by assuming half of the peak hour 25 vehicle trips (13 vehicle trips) will occur between 1:00pm and 2:00pm.

<sup>2</sup> Transport Impact Assessment – Taronga Zoo – Proposed Australia Habitat & Taronga Wildlife Retreat – Transport Impact Assessment, GTA Consultants, 07 March 2016

Considering the initial surge in visitation and the proposed retreat, the additional traffic generation is expected to be some 38 to 43 vehicles per hour during the typical site peak hour. For this temporary period, this equates to less than one additional vehicle per minute.

### 5.2.2. Morning and Afternoon Commuter Peak

The average traffic generated by the zoo during the road network peak period has historically been approximately 210 and 160 vehicles per hour during the morning and afternoon commuter peak hours respectively. Hence, the temporary increase in peak hour traffic flows after the opening period is expected to be up to 21 vehicles during the road network peak hour. This is equivalent to one additional vehicle every three minutes.

The retreat is not expected to generate any trips during the morning commuter peak hour. With retreat guest arrivals for the retreat will occur between 3:30pm and 5:30pm, it is assumed 70 per cent of the 25 vehicle trips, equivalent to 18 vehicle trips will occur during the afternoon commuter peak hour.

Based on the above, the additional traffic generation is expected to be between 21 and 39 vehicles per hour during any road network peak hours. This is equivalent to one additional vehicle every two to three minutes.

## 5.3. Traffic Impacts

### 5.3.1. Base Data

Traffic surveys were completed at the two Whiting Beach Road intersections with Bradleys Head Road and Prince Albert Street during the following peak periods:

- Thursday 2 July 2020 from 7:30am to 11:30am and 2:30pm to 6:30pm
- Saturday 4 July 2020 from 9:00am to 11:00am.

It is noted that the surveys occurred in the last week of Term 2 for NSW schools.

The morning and afternoon peak hours on the Thursday were found to occur from 9:30am to 10:30am and 3:30pm to 4:30pm respectively. The Saturday peak occurred from 9:15am to 10:15am. Full survey results are included in Appendix C.

Taronga Zoo advised that 2,125 and 4,580 visitors attended the zoo on the surveyed days and that currently 60 per cent of staff returned on site. In comparison, there were on average 3,150 and 4,900 visitors that attended the zoo on the same days in June and July 2019 (excluding the NSW school holiday period). This suggests there has been an approximately 30 per cent reduction in visitation on the Thursday and a seven per cent reduction on Saturday compared to 2019.

Notwithstanding this, there has been a significant impact on interstate/ overseas visitors this year who typically account for 30 to 40 per cent of total visitors and travel by public transport (i.e. some 2,000 and 3,100 visitors being locals on Thursdays and Saturday typically). When this is considered and noting visitors on the surveyed days were predominantly locals that drove, the traffic conditions surveyed would not represent a typical day as there were more vehicles this year than typically, particularly on the Saturday.

It was also advised that visitors can only purchase tickets online at the moment, so the arrival patterns are atypical as visitors arrive closer to opening time and not spread across the day to avoid long

queues at the ticket booth. This would suggest the site peaks would be more concentrated than typical, which is evident in the Saturday results that show the peak hour occurred from 9:15am.

Therefore, a conservative approach has been adopted for the purposes of this study using the peak hours recorded from the surveys with no adjustments, noting traffic conditions were higher than typical. The site and commuter peak traffic generations for the development, determined in Section 5.2, have been applied to the surveyed peak hours to assess the impact.

### 5.3.2. Intersection Operation

The operation of the key intersections has been assessed using SIDRA INTERSECTION<sup>3</sup>, a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by TfNSW, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 5.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 5.1: SIDRA INTERSECTION level of service criteria

Level of Service (LOS)	Average Delay per vehicle (secs/ veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 5.2 presents a summary of the existing and post development operation of the study intersections, with full results presented in Appendix D. The results for these priority-controlled intersections are based on the movement with highest delay.

For the post development scenario, it was assumed that 80 per cent of the additional traffic would use Bradley Head Road and 20 per cent via Whiting Beach Road in either direction.

<sup>3</sup> Program used under license from Akcelik & Associates Pty Ltd.

Table 5.2: Intersection operating conditions

Intersection	Scenario	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Whiting Beach Road/ Bradleys Head Road	Existing	Weekday AM	0.14	6	4	A
		Weekday PM	0.03	5	1	A
		Saturday	0.11	6	3	A
	Post Development	Weekday AM	0.14	6	4	A
		Weekday PM	0.03	6	1	A
		Saturday	0.11	6	3	A
Whiting Beach Road/ Prince Albert Street	Existing	Weekday AM	0.11	5	3	A
		Weekday PM	0.03	5	1	A
		Saturday	0.02	5	1	A
	Post Development	Weekday AM	0.11	5	3	A
		Weekday PM	0.04	5	1	A
		Saturday	0.02	5	1	A

Table 5.2 indicates that the study intersections currently operate satisfactorily, with acceptable delays and queues during the surveyed peak periods and that the additional traffic generated in the initial weeks of opening of the redeveloped Upper Australia exhibit would not change the operation.

## 5.4. Summary

It is expected that the local traffic conditions near the site would not be affected by this proposal and as such it is not anticipated that mitigation measures are necessary.

## 6. PRELIMINARY CONSTRUCTION TRAFFIC IMPACT

06

## **6.1. Proposed Works**

The Upper Australia exhibit is expected to be undertaken in the following stages:

- Stage 1 – demolition of the existing exhibits
- Stage 2 – detailed excavation for the proposed exhibit
- Stage 3 – construction of redeveloped exhibit.

## **6.2. Work Hours**

It is proposed that construction works will be carried out between the following hours:

- Mondays to Fridays: 7:00am to 6:00pm
- Saturdays: 7:00am to 1:00pm if inaudible on adjoining premises, otherwise 8:00am to 1:00pm.

No construction vehicle access is to be permitted on public holidays.

Any work outside the proposed construction hours will be subject to specific prior approval from Mosman Council or DPIE.

## **6.3. Construction Traffic Vehicle Type**

Construction vehicles likely to be generated by the proposed construction activities include:

- articulated trucks for the delivery of machinery (including mobile cranes, diggers)
- trucks to collect demolition and excavated materials
- general vehicles such as concrete trucks, medium rigid trucks, small rigid trucks, tradespeople's utilities and courier vans.

## **6.4. Construction Vehicle Access**

The construction vehicles will primarily use a temporary access from Bradleys Head Road to access the construction site, which will be constructed adjacent to the Upper Australia exhibit, via the temporary demolition of a Zoo wall.

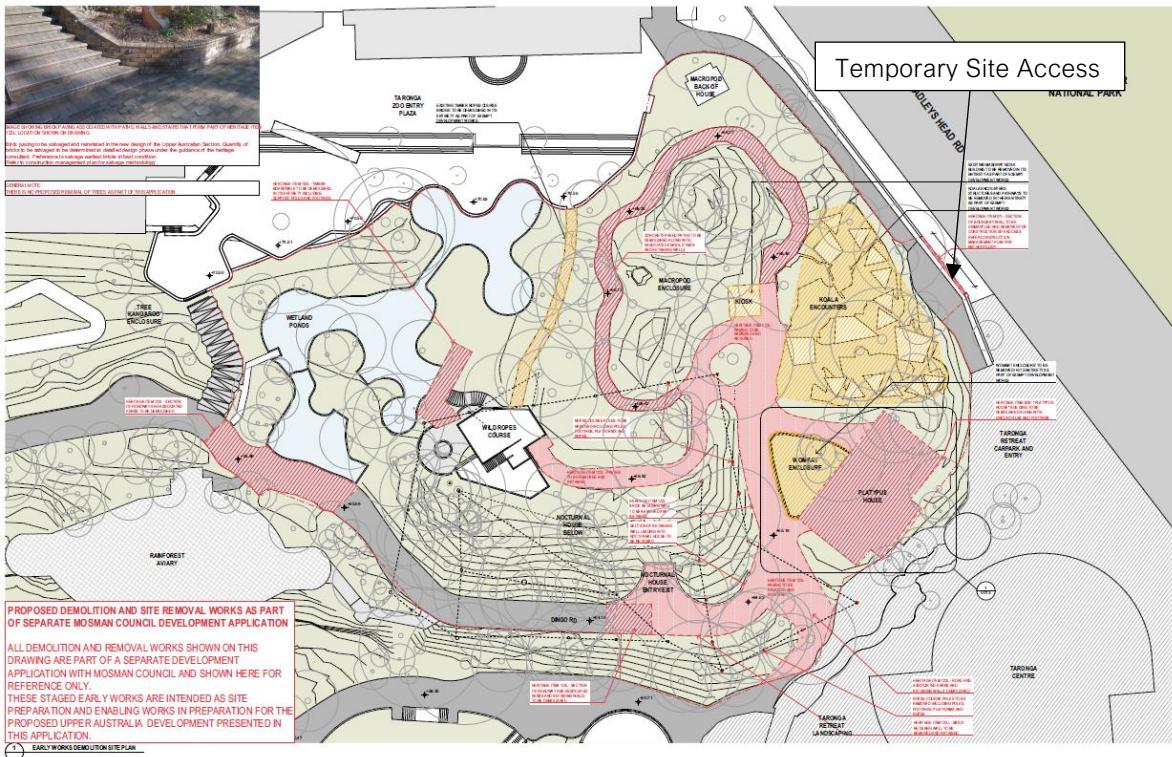
The temporary access will be manned by an accredited traffic controller to manage the interaction of construction vehicle access and pedestrian, cyclist, and general traffic movements along Bradleys Head Road. Where practical, the traffic controller would not stop through traffic along Bradleys Head Road to assist with construction vehicle access, however, find an appropriate gap in traffic flow prior to releasing a construction vehicle. Construction vehicles entering the site will be required to give way to vehicles, pedestrians, and cyclists under normal road rules. A traffic control plan that shows required traffic and pedestrian control signage will be prepared and implemented by accredited personnel prior to works commencing.

Secondary access is also available via the Whiting Beach Road zoo access, although its use will be limited.

Refer to Figure 6.1 below which presents the access points and construction activities within the zoo grounds.

## PRELIMINARY CONSTRUCTION TRAFFIC IMPACT

Figure 6.1: Construction plan



Source: Lahznimmo Architects drawing no A-DA-0012 Revision 2, dated 15 June 2020

Taronga Zoo also implements a strict vehicle policy within the zoo grounds, which is applicable for the proposed construction works. Vehicle policy is as follows:

1. Restrict movements of vehicles to the minimum requirements for executing the Works. Do not drive private vehicles into the zoo grounds.
2. Do not exceed 10 kilometres per hour.
3. Do not drive vehicles including suppliers' delivery vehicles within the public areas of the zoo between the hours of 9:00am to 5:00pm during school holidays and weekends, and 10:00am to 3:00pm at other times.
4. Between 6:00am and 9:00am and between 5:00pm and 6:00pm during school holidays and between 6:00am and 10:00am and between 3:00pm and 6:00pm at other times, up to 10 vehicle movements are permitted per day in the public areas. Escort larger vehicles to the construction site.
5. Movements of vehicles in other areas of the zoo are restricted to between the hours of 6:00am to 6:00pm subject to the approval of the zoo's management.
6. Roads within the zoo may not have a heavy duty pavement. The roads may not be suitable for articulated or long wheel base vehicles. Some of the roads are unsealed and may not be suitable for use in wet weather.
7. Roads within the zoo may have limited width and headroom. Check the access before organising vehicular transport.
8. Use a route as directed by zoo staff and notified prior to start and use service roads where possible.

9. Limit movement of heavy vehicles to be used in removing spoil or other materials from the Taronga Zoo to between the hours of 7.30am to 4.30pm on Monday to Friday and between 7.30am to 1:00pm on Saturday, or as required by Mosman Council, subject to restrictions in item 3 above for vehicle movements within the zoo.
10. Take responsibility for any damage caused by vehicles, including those of subcontractors and suppliers, using the roads and repair any such damage at no cost to the Principal.
11. Keep access roads and adjacent footpaths, gutters and drains clear of construction waste, debris and mud, clean as required and remove waste, debris and mud from the zoo, all at the Contractor's cost.
12. Comply with the physical limitations on the height of vehicles using zoo roads.
13. Where it is necessary to remove fences within the zoo to enable access to be gained to work areas, keep the areas secure at all times and reinstate the fences as soon as practical.
14. Do not ride in/ on back of vehicles; and ride in seat with seat belt fastened.
15. Fuelling of vehicle at or near public areas is not permitted.
16. Park vehicles on site within the site compound or at locations as directed by zoo staff.
17. The zoo is a pedestrian park and pedestrians have right of way.

As listed above, the construction vehicles accessing the zoo grounds are restricted to occur outside of the busy zoo operating period. Vehicle access within the zoo grounds would generally be limited to 6:00am to 10:00am and 3:00pm to 6:00pm. As such, the majority of construction vehicle access will occur via the temporary access that provides direct access to the construction site, i.e. limits use of the zoo grounds.

### 6.5. Construction Vehicle Routes

The designated truck routes to/ from the arterial road network includes the use of Military Road and Bradley Head Road. These vehicle routes are shown in Figure 6.2.

All construction vehicles accessing the site would do so in full compliance with the required clearway and parking restrictions. No queuing of trucks would be permitted on public roads. Truck arrivals would be coordinated to ensure incoming trucks are not required to wait for a truck space to be available on-site.

## PRELIMINARY CONSTRUCTION TRAFFIC IMPACT

Figure 6.2: Construction vehicle access routes



Base map Source: Sydway

## 6.6. Expected Traffic and Parking Demands

### 6.6.1. Expected Peak Periods

The zoo's peak operating periods occur between 11:00am and 3:00pm. It is understood that construction activities are typically carried out from 7:00am to 6:00pm Monday to Friday and 7:00am to 1:00pm on Saturdays with peak vehicle movements relating to the construction works generally occurring an hour before construction activities start as well as an hour after construction activities ends, as workers enter and leave the site. As such, given the peak vehicle movements relating to the construction works will only overlap with the zoo's peak operation on a Saturday midday, i.e. between 1:00pm and 2:00pm, this assessment will focus on this period only.

The assessment for parking and traffic impacts in the surrounding neighbourhood considers the traffic and parking generation associated with the following overlapping activities:

- movement of construction related workers
- movement of staff members
- movement of zoo visitors.

### 6.6.2. Existing Traffic and Parking Circumstance

The analysis detailed in Section 2.4 reported a surveyed traffic generation of 358 vehicles per hour (vph) during the weekend peak, which is 10:00am to 11:00am. Corresponding to this period, the carpark occupancy survey revealed an 85<sup>th</sup> percentile spare capacity of 216 available car parking

spaces. Considering the peak construction traffic is envisaged to occur within the hour after construction activities end at 1:00pm, it is noted that both the peak visitation and construction traffic would not coincide.

At this stage there is no intent of overlapping the Upper Australia exhibit construction projects with any other works by Taronga Zoo, hence no compounding construction activities and traffic/ parking demand is expected. Any future construction works that may occur at the zoo and overlap with the Upper Australia exhibit construction will be required to assess and manage the cumulative impact of these works.

### 6.6.3. Heavy Vehicle Generation

Heavy vehicle traffic would mainly be generated by activities associated with the following:

- delivery of construction materials
- delivery and removal of construction equipment and machinery.

The number of daily truck movements will vary depending on the works being conducted on the specific day or timeframe in the construction programme. At periods where timing is critical, the worst-case assessment is estimated as 10 truck movements per day on a typical Saturday, which is coinciding with the peak visitation period of the zoo. This would result in up to two truck movements in the peak hour, conservatively assuming 20 per cent of daily generation arriving within the peak periods.

No parking demand is expected of heavy vehicles.

### 6.6.4. Light Vehicle Generation

Light vehicle traffic generation would be largely generated by construction worker traffic movements to and from the site.

It is expected in the worst-case scenario there could be up to 30 construction workers on the typical Saturday, with an average of 20 workers. Construction workers will be encouraged to carpool and to use public transport where possible to ensure that parking can be accommodated wholly within the zoo. Based on the above, it is expected that 20 light vehicles per day could be expected during peak construction.

### 6.6.5. Summary of Construction Traffic Generation

On this basis, the Saturday peak traffic generation and parking demand for the works are indicated in Table 6.1. The following only indicates peak site traffic generation (between 1:00pm and 2:00pm) when workers leave the site at the end of the workday. It should be noted that outside this period, traffic generation will only include construction vehicles, which would equate to up to two to three vehicles per hour.

Table 6.1: Saturday peak (1:00pm-2:00pm) traffic generation and parking demand

Vehicle Type	Traffic Generation	Parking Demand
Workers (Cars)	Up to +20 vph	Up to 20 required
Trucks	Up to +2 vph	No parking demand

## PRELIMINARY CONSTRUCTION TRAFFIC IMPACT

### 6.6.6. Traffic Impact

Based on the assessment above, the expected Saturday construction traffic generation is expected to be up to 22 vehicles per hour.

It is noted that not all the workers would arrive and depart at the same time as some are likely to remain at site to pack up after shutting down for the day and some might have left earlier depending on their work schedule. As such, the worker traffic would likely be further distributed over the space of a few hours, thereby reducing the hourly traffic impact.

Furthermore, the peak Saturday operational traffic occurs between 10:00am and 11:00am, which hence does not coincide with the peak construction traffic, which normally occurs between 1:00pm and 2:00pm. Furthermore, with the current global circumstances extending for a foreseeable period, visitor traffic to the site could likely be lower than is typical during the construction period.

Therefore, the overall traffic impact during construction period is expected to be nominal with the Taronga Zoo site and the adjacent roads expected to accommodate the peak construction traffic generation.

### 6.6.7. Parking Impact

The extensive parking survey demonstrated an 85<sup>th</sup> percentile spare capacity of 216 spaces across 22 months and taking seasonal effects into consideration. The anticipated peak parking demand during construction, which sums to a total of 20 spaces, will be comfortably accommodated within the 85<sup>th</sup> percentile car parking capacity.

## 6.7. Management of On-Street Parking Demand

Based on the findings presented in the previous section with respect to the available capacity outside of the peak times, it is assessed that the management of carpark usage and in particular, its impact on surrounding on street parking, is the subject of choice rather than capacity.

Initiatives to encourage on-site parking, include:

- It is understood that the zoo has continually issued internal communications amongst staff members to avoid using on street parking.
- It is understood that the zoo has implemented various strategies including discounted night time parking rates and 'staggered session' tickets for Vivid Sydney to avoid the concurrent arrival and departure of large number of crowd.
- Promotion of public transport.

## 6.8. Emergency Access

Access to the construction area by emergency vehicles would be available via Whiting Beach Road. Emergency vehicle access to the broader zoo grounds will not be affected by the construction activities.

In addition, access to neighbouring sites by emergency vehicles should not be affected by the works as the roads and footpaths near the site would be unaffected

## 7. OTHER TRANSPORT CONSIDERATIONS

07

### 7.1. Pedestrian and Cyclist Implications

Pedestrian and cyclist access to the zoo will remain the same as current arrangement during both construction and operation of the Upper Australia exhibit.

It is anticipated that proposal may attract some additional walking and cycling trips during the first few weeks after the opening of the redeveloped exhibit. However, the additional trips will not impact on the existing pedestrian and cycling facilities in the area.

The impact of the additional vehicular traffic arising from the development during construction and first few weeks of the exhibit opening would have minimal impact on existing walking and cycling on the surrounding road network.

### 7.2. Public Transport Implications

Similarly, the proposal would generate some additional trips utilising the existing public transport system. It is expected that these trips would be modest and are unlikely to result in any additional capacity stress on current public transport systems in the area.

### 7.3. Loading and Servicing Arrangements

As the proposed redeveloped Upper Australia exhibit is effectively an upgrade of existing exhibits, the operational and servicing arrangements of the exhibit will remain the same as the current exhibitions with loading, servicing and other delivery management practices in place not expected to materially alter and to remain fully self-contained within the zoo's site.

### 7.4. Green Travel Plan

#### 7.4.1. Overview

A GTP is a package of measures aimed at promoting sustainable travel and reducing reliance on the private car. It is not designed to be ‘anti-car’ however will encourage and support people’s aspirations for carrying out their daily business in a more sustainable way. Travel plans can provide both:

- measures which restrict car use (disincentives or ‘sticks’)
- measures which encourage or support sustainable travel, reduce the need to travel or make travelling more efficient (incentives or ‘carrots’).

The travel plan would promote the use of transport, other than the private car, provide choice for staff and visitors to travel to and from the site, which is more sustainable and environmentally friendly.

Indeed, there are a range of “non-car” transport options that are available at the site which have been described in this report.

The aim of GTPs is to bring about better transport arrangements for working and visiting a site. The key objectives of GTPs are:

- to encourage walking
- to encourage cycling
- to encourage the use of public transport
- to reduce the use of the car, in particular single car occupancy
- where it is necessary to use the car, encourage more efficient use.

## OTHER TRANSPORT CONSIDERATIONS

It is the intention therefore that the travel plan will deliver the following benefits:

- enable higher public and active travel mode share targets to be achieved
- contribute to greenhouse gas emission reductions and carbon footprint minimisation
- contribute to healthy living for all
- contribute to social equity and reduction in social exclusion
- improve knowledge and contribute to learning.

### 7.4.2. Site Specific Application

The redeveloped Upper Australian exhibit is not expected to increase trips to Taronga Zoo in the long-term or have the capability to change travel patterns to/ from Taronga Zoo which is accessible by established bus/ coach and ferry services. Furthermore, the proposal will not increase staff numbers at the zoo, with only a 10 per cent increase in visitation expected in the first few weeks after exhibit opening before normalising.

On this basis, the proposal does not alone warrant a GTP, with any need for a GTP required for the overall zoo operation.

Notwithstanding, Taronga Zoo has implemented a GTP for staff and visitors (primarily primary and secondary school students that arrive by coach) to the Taronga Institute of Science and Learning (TISL) that was prepared by Traffix and dated 4 July 2018.

The GTP investigated travel modes for TISL staff in 2015 and set targets and measures to increase use of public transport and carpooling for the new facility. The GTP included targets to reduce staff trips by vehicle from 48 per cent to 40 per cent, at the same time increase public transport trips from 32 per cent to 39 per cent. The target for walking only was 14 per cent (one per cent increase), whilst cycling was proposed to remain at seven per cent.

A Transport Access Guide (TAG) was also prepared by Traffix that requires updating every six months. This TAG is recommended to be distributed to all zoo staff and visitors, including integrating into the Taronga Zoo website within the 'Getting to the Zoo' page.

It is expected that similar travel patterns and behaviours apply to all staff at Taronga Zoo and therefore the GTP and its strategies and transport initiatives, such as the TAG and use the TISL carpooling service called Comovee would apply and should be available for all zoo staff.

As such, it is recommended that the GTP is updated to account for all zoo staff once operation and staff numbers are normalised following the current health situation based on a new travel mode and staff residence survey to reset mode share targets and adjust strategies and transport initiatives accordingly.

## 8. CONCLUSION

08

### 8.1. Summary

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

1. The proposal is for the redevelopment of an existing exhibit that does not involve additional facilities and therefore will not generate any additional parking demand outside of the initial opening weeks of the Exhibit.
2. On this basis, additional parking is not proposed to be provided on site.
3. However, it is acknowledged that there would be some increase in additional parking demand during the first few weeks following the opening of the redeveloped exhibit. Any temporary increase in demand can be accommodated within the existing on-site car parking provision.
4. The results of the parking analysis indicated that the 85th percentile peak parking occupancy for existing on-site car parking was 618 spaces, being equivalent to a minimum of 216 available car parking spaces.
5. The existing multistorey car park would have sufficient capacity to accommodate the anticipated 85th percentile additional peak parking demand of 93 spaces associated with the temporary increase in parking demand associated with the initial opening weeks visitation surge and when accounting for the guests of the Australia Habitat & Taronga Wildlife Retreat.
6. It is proposed that all deliveries to and from the redeveloped exhibit will be provided via the existing Whiting Beach Road access.
7. During the first few weeks following the opening of the redeveloped exhibit, increase in peak hour traffic flows is expected to be up to 30 vehicles per hour.
8. Considering this temporary increase, in combination with the 13 vehicle trips associated with retreat guests, the additional traffic generation is anticipated to be up to 43 vehicles per hour during the typical zoo peak hour.
9. Traffic modelling confirmed the existing road network would absorb this minor increase without any such traffic related implications given the zoo is the primary traffic generator in the area.
10. It is estimated that the construction stage would generate some 10 construction vehicle deliveries per day (i.e. up to two vehicles per hour) and 20 light vehicles per day. At this frequency, it is unlikely that the surrounding road capacity is adversely impacted.
11. Whilst the proposal itself does not warrant a Green Travel Plan, Taronga Zoo has a Green Travel Plan and Transport Access Guide for staff and visitors (primarily primary and secondary school students that arrive by coach) to the Taronga Institute of Science and Learning; which is recommended to be updated for all zoo staff based on a new travel mode and staff residence survey to reset mode share targets and adjust strategies and transport initiatives accordingly.

## A. TFNSW CONSULTATION

A

## Ashish Modessa

---

**From:** Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>  
**Sent:** Thursday, 25 June 2020 3:17 PM  
**To:** Felix Liu; Ashish Modessa; Robert Rutledge  
**Cc:** Kane Williams; Kristine Marshall; Brigitte Bradley; Andrew Zhou; Michael Head  
**Subject:** RE: 20200625 TfNSW response - SYD20/00510/02 - RE: SSD-10456 Taronga Zoo Upper Australia Precinct - Transport Requirements

Hi Ashish.

Not much further to add from Felix wrt the traffic surveys. Support what Felix is suggesting and traffic flows (not public transport usage though) across Sydney is returning to almost normal. However, as a significant proportion of visitors to the Zoo are via PT it would be good to get an understanding of how this lower PT use at the moment might impact on the visitor numbers and also potentially higher dependence on private vehicle use. I guess there is a limit to the supply of parking around the Zoo which might limit the extent to which people can substitute PT to car. I am pretty sure the Zoo would be able to provide a daily / weekly picture of visitor numbers pre and post covid-19.

I do agree with Felix on the GTP discussion. I will nevertheless ask our TDM team to clarify if the approach is ok.

Mark Ozinga  
Principal Manager Land Use Planning & Development  
Customer Strategy & Technology Division  
Transport for NSW

T 0439 489 298  
Level 26, 477 Pitt Street, Haymarket, NSW, 2000

---

**From:** Felix Liu [mailto:[Felix.Liu@transport.nsw.gov.au](mailto:Felix.Liu@transport.nsw.gov.au)]  
**Sent:** Thursday, 25 June 2020 2:22 PM  
**To:** Ashish Modessa <[Ashish.Modessa@gta.com.au](mailto:Ashish.Modessa@gta.com.au)>; Development Sydney <[Development.Sydney@rms.nsw.gov.au](mailto:Development.Sydney@rms.nsw.gov.au)>  
**Cc:** Kane Williams <[kane.williams@gta.com.au](mailto:kane.williams@gta.com.au)>; Kristine Marshall <[kmarshall@zoo.nsw.gov.au](mailto:kmarshall@zoo.nsw.gov.au)>; Brigitte Bradley <[bbradley@urbis.com.au](mailto:bbradley@urbis.com.au)>; Andrew Zhou <[Andrew.Zhou@gta.com.au](mailto:Andrew.Zhou@gta.com.au)>; Michael Head <[mhead@zoo.nsw.gov.au](mailto:mhead@zoo.nsw.gov.au)>  
**Subject:** 20200625 TfNSW response - SYD20/00510/02 - RE: SSD-10456 Taronga Zoo Upper Australia Precinct - Transport Requirements

Hi Ashish,

Reference is made to your consultation request dated 13 June 2020 regarding the traffic and transport component for the SSD-10456 Taronga Zoo Upper Australian Precinct development.

Transport for NSW (TfNSW) has reviewed the submitted information and provides the following comments for your consideration:

- Traffic Surveys and Modelling  
It is understood that these two intersections of Whiting Beach Road/ Bradleys Head Road and Whiting Beach Road / Prince Alberts Street are the key intersections providing access to the Taronga Zoo car park. As such, it is critical for TfNSW to understand the impact of the proposed development on the operation of these two (2) intersections. In particular, the Bradleys Head Road is a classified road.

It is also understood that the Taronga Zoo was re-opened since 1 June 2020 and traffic level in the Sydney metropolitan area is recovering. As such, the traffic surveys and modelling at these two (2) intersections are required as set out in the Planning Secretary's Environmental Assessment Requirements (SEARs). Reasonable assumptions should be made to ensure that the analysis is accurate and replicates typical conditions of peak period(s).

- **Green Travel Plan**

The argument raised by the applicant is sound in terms of providing an overview Green Travel Plan (GTP) in the Transport and Accessibility Impact Assessment.

As such, TfNSW will condition that the detailed GTP should be developed prior to the issue of the Occupation Certificate.

I hope this has been of assistance. However, if you have any questions, please do not hesitate to contact me.

Kind regards

Felix Liu

Land Use Planner  
Sydney Roads  
Greater Sydney  
Transport for NSW

**Tel: 02 8849 2113**  
Level 5/27 Argyle Street Parramatta NSW 2150



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I acknowledge the traditional owners and custodians of the land in which I work and pay my respects to Elders past, present and future.

---

**From:** Ashish Modessa [<mailto:Ashish.Modessa@gta.com.au>]

**Sent:** Friday, 12 June 2020 2:11 PM

**To:** Development Sydney <[Development.Sydney@rms.nsw.gov.au](mailto:Development.Sydney@rms.nsw.gov.au)>

**Cc:** Kane Williams <[kane.williams@gta.com.au](mailto:kane.williams@gta.com.au)>; Kristine Marshall <[kmarshall@zoo.nsw.gov.au](mailto:kmarshall@zoo.nsw.gov.au)>; Brigitte Bradley <[bbradley@urbis.com.au](mailto:bbradley@urbis.com.au)>; Andrew Zhou <[Andrew.Zhou@gta.com.au](mailto:Andrew.Zhou@gta.com.au)>; Michael Head <[mhead@zoo.nsw.gov.au](mailto:mhead@zoo.nsw.gov.au)>

**Subject:** SSD-10456 Taronga Zoo Upper Australia Precinct - Transport Requirements

Dear Sir/ Madam

GTA Consultants has been commissioned to prepare the Transport and Accessibility Impact Assessment for the proposed Upper Australia Precinct at Taronga Zoo.

The proposal involves the redevelopment of the existing Upper Australia exhibit including star attractions including kangaroo, koala, platypus, wombat and emu exhibits. As such, it aims to improve an existing exhibit and will not include an increase in the use of the site. Accordingly, it is anticipated that visitation resultant to this proposal will be largely consistent with the historical circumstances, except for the first few weeks of an exhibit opening where there may be an increase in local visitor volumes (~10 per cent).

As part of the SSDA process, GTA is required to consult with TfNSW on the traffic and transport related SEARS requirements (SEARS attached).

### Traffic Surveys and Modelling

A requirement is to complete modelling and analysis of two key Whiting Beach Road intersections that provide access to the site.

Given the existing global circumstance of COVID-19 and closure of the Zoo, traffic conditions near the Zoo are not considered an accurate representation of normal road conditions, therefore any traffic surveys would not be appropriate for a detailed assessment. The Zoo also does not have any historic count data at the key intersections.

Nonetheless, as mentioned the proposal is not expected to increase visitation in the long term and any temporary increase in the initial weeks of opening has been estimated to be up to 30 additional vehicles per hour in either the site or commuter peak periods. Noting that the majority of this additional traffic will park in the multi-storey car park that is accessed from Bradleys Head Road, most of these movements will be through the intersection of Bradleys Head Road/ Whiting Beach Road (i.e. minimal turning movements), with traffic in the area largely associated with the Zoo.

On this basis, GTA does not propose to include any survey or modelling of the key intersections in the Transport and Accessibility Impact Assessment with an empirical assessment completed.

### Green Travel Plan

Another requirement is to prepare a Green Travel Plan in consultation with TfNSW. With the Zoo currently closed, it is difficult to carry out mode share surveys to understand typical staff travel behaviours to inform a GTP.

The proposal will not increase staff numbers, is not expected to increase visitation in the long term or be able to influence travel patterns to the Zoo which is currently accessible by established bus/ coach and ferry services. It is our view that the proposal does not alone warrant a GTP, with any need for a GTP required for the overall Zoo operation.

With this in mind, the Zoo has implemented a GTP for staff and visitors (primarily primary and secondary school students that arrive by coach) to the Taronga Institute of Science and Learning (TISL). As such, there is opportunity to expand on this GTP to cover all zoo staff based on new staff travel mode and residence surveys once zoo operation and staff numbers normalise. This can help reset mode share targets and strategies/ initiatives in the current GTP to suit the larger staff population.

On this basis, GTA proposes to include a Overview GTP in the Transport and Accessibility Impact Assessment, with any detailed GTP recommended to be prepared within 2-3 months of zoo operation and staff numbers normalising, hence not required to satisfy the SEARS.

GTA seeks feedback on these approaches prior to finalising the Transport and Accessibility Impact Assessment for lodgement.

If you could please provide a response in the next week (by 19<sup>th</sup> June) that would be greatly appreciated.

If you would like to discuss further, please give me a call.

Regards

Ashish Modessa  
Senior Consultant  
GTA Consultants  
**P** 02 8448 1800 **D** 02 8448 1822 **M** 0432 698 979  
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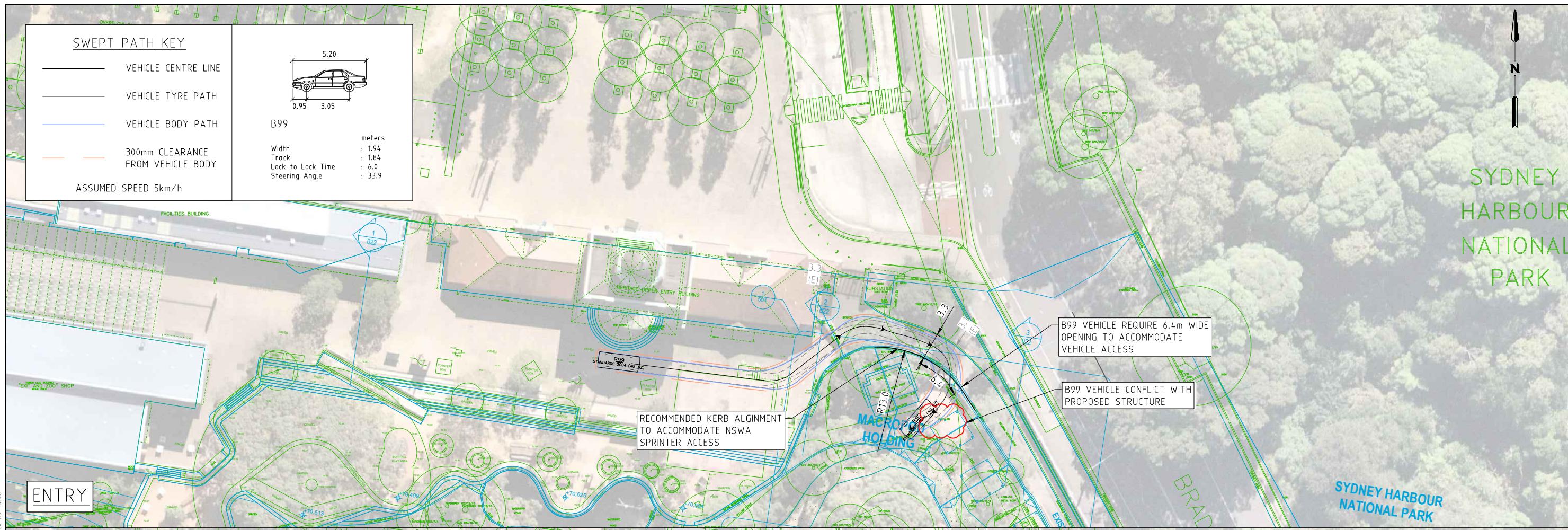
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## B. SWEPT PATH ASSESSMENT

B



PLOTTED BY RAYMOND ZHANG ON 16/07/2020 AT 14:46

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\GTA.COM.AU\PROJECT FILES\PROJECTS\SYD\N192210-N192210 TARONGA ZOO - UPPER AUSTRALIA TIA\CAD\N192210-SK02-P2.DWG

**BASE PLAN**  
ARCHITECTURAL BASE IN BLUE  
DRAWING NO: A-DA-021, REVISION 02, DATED 22/06/2020  
BY LAHZNIMMO ARCHITECTS

**SURVEY BASE IN GREEN**  
DRAWING NO: TZ Master Survey with  
Infrastructure\_MGA, REVISION B, DATED 20/03/2019 BY  
HAMMOND SMEALLIE & CO PTY LTD

**AERIAL IMAGE**  
NEARMAP, DATED 18 APRIL 2020



**PRELIMINARY PLAN**  
FOR DISCUSSION PURPOSES ONLY  
SUBJECT TO CHANGE WITHOUT  
NOTIFICATION

**WARNING**  
BEWARE OF UNDERGROUND SERVICES  
THE LOCATIONS OF UNDERGROUND SERVICES ARE  
PROVISIONAL AND SUBJECT TO CHANGE. THESE LOCATIONS  
SHOULD BE PROVEN ON SITE. NO GUARANTEE IS  
GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED

R.ZHANG

DESIGN CHECK

K.WILLIAMS

APPROVED BY

K.WILLIAMS

DATE ISSUED

16 JULY 2020

SCALE

A3

0 2.5 5 10 1500

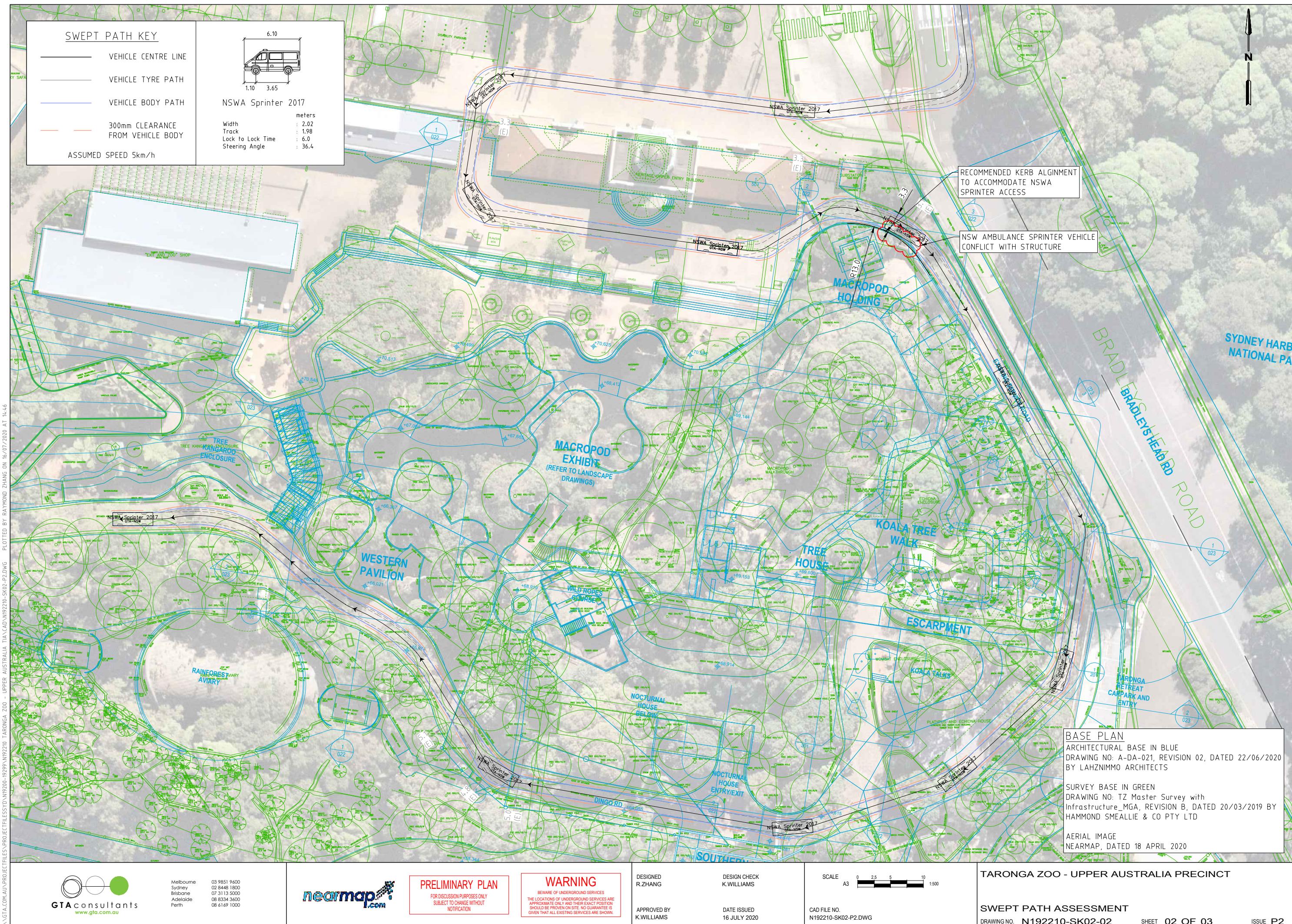
CAD FILE NO.  
N192210-SK02-P2.DWG

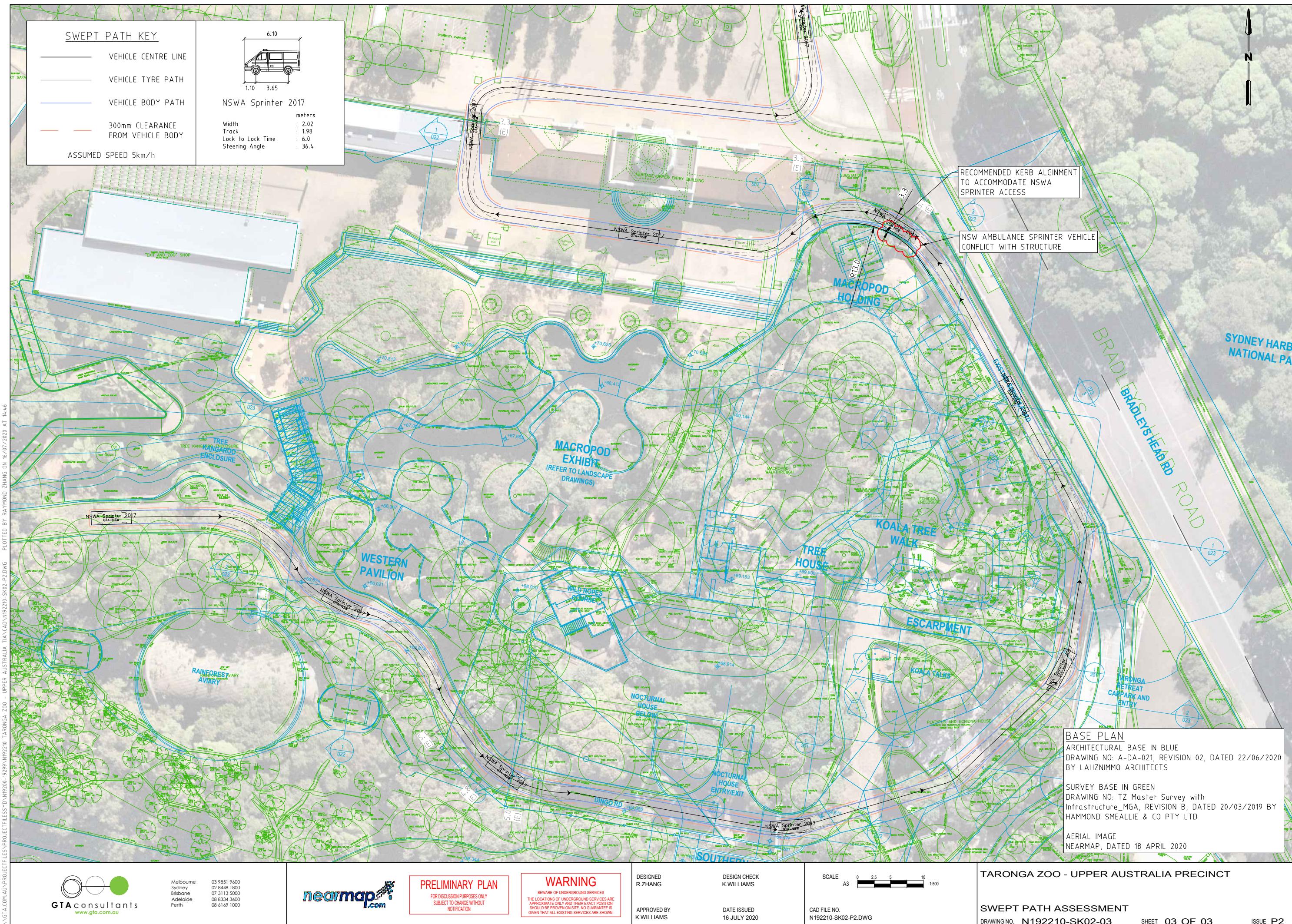
TARONGA ZOO - UPPER AUSTRALIA PRECINCT

**SWEPT PATH ASSESSMENT**  
DRAWING NO. N192210-SK02-01

SHEET 01 OF 03

ISSUE P2

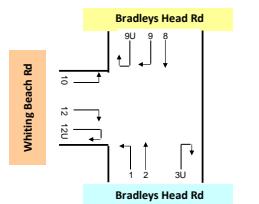




## C. TRAFFIC SURVEYS

C

**Job No.** : NS812  
**Client** : GTA  
**Suburb** : Mosman  
**Location** : 1. Bradleys Head Rd / Whiting Beach Rd  
  
**Day/Date** : Thu, 2nd July 2020  
**Weather** : Fine  
**Description** : Classified Intersection Count  
  
**: 15 mins Data**

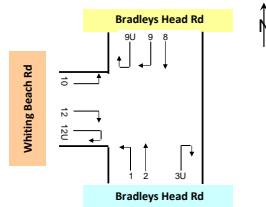


**Classifications** Class 1 Class 2  
Lights Heavies

Approach	Bradleys Head Rd																				
	Direction	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3U (U Turn)			Direction 4L (Right Turn)	Direction 5L (Left Turn)			Direction 6L (Through)			Direction 7R (Right Turn)	Direction 8R (Left Turn)		
		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
	7:30 to 7:45	1	0	1	4	2	6	0	0	0		0	0	0	0	0	0		0	0	0
	7:45 to 8:00	0	1	1	1	4	5	0	0	0		0	0	0	0	0	0		0	0	0
	8:00 to 8:15	3	0	3	3	2	5	0	0	0		0	0	0	0	0	0		0	0	0
	8:15 to 8:30	0	0	0	4	2	6	0	0	0		0	0	0	0	0	0		0	0	0
	8:30 to 8:45	4	0	4	6	2	8	0	0	0		0	0	0	0	0	0		0	0	0
	8:45 to 9:00	3	0	3	9	2	11	0	0	0		0	0	0	0	0	0		0	0	0
	9:00 to 9:15	3	0	3	6	5	11	0	0	0		0	0	0	0	0	0		0	0	0
	9:15 to 9:30	2	1	3	9	1	10	0	0	0		0	0	0	0	0	0		0	0	0
	9:30 to 9:45	4	2	6	14	4	18	0	0	0		0	0	0	0	0	0		0	0	0
	9:45 to 10:00	2	0	2	12	2	14	0	0	0		0	0	0	0	0	0		0	0	0
	10:00 to 10:15	3	0	3	12	5	17	0	0	0		0	0	0	0	0	0		0	0	0
	10:15 to 10:30	4	0	4	11	2	13	0	0	0		0	0	0	0	0	0		0	0	0
	10:30 to 10:45	4	0	4	8	4	12	0	0	0		0	0	0	0	0	0		0	0	0
	10:45 to 11:00	5	1	6	13	1	14	0	0	0		0	0	0	0	0	0		0	0	0
	11:00 to 11:15	5	0	5	15	3	18	0	0	0		0	0	0	0	0	0		0	0	0
	11:15 to 11:30	4	0	4	18	1	19	0	0	0		0	0	0	0	0	0		0	0	0
	<b>AM Totals</b>	<b>47</b>	<b>5</b>	<b>52</b>	<b>145</b>	<b>42</b>	<b>187</b>	0	0	0		0	0	0	0	0	0		0	0	0
	14:30 to 14:45	12	0	12	43	3	46	0	0	0		0	0	0	0	0	0		0	0	0
	14:45 to 15:00	4	0	4	34	1	35	0	0	0		0	0	0	0	0	0		0	0	0
	15:00 to 15:15	10	0	10	44	2	46	0	0	0		0	0	0	0	0	0		0	0	0
	15:15 to 15:30	11	0	11	21	2	23	0	0	0		0	0	0	0	0	0		0	0	0
	15:30 to 15:45	13	0	13	28	2	30	0	0	0		0	0	0	0	0	0		0	0	0
	15:45 to 16:00	17	0	17	25	3	28	0	0	0		0	0	0	0	0	0		0	0	0
	16:00 to 16:15	10	0	10	29	4	33	0	0	0		0	0	0	0	0	0		0	0	0
	16:15 to 16:30	7	0	7	22	2	24	0	0	0		0	0	0	0	0	0		0	0	0
	16:30 to 16:45	7	0	7	25	4	29	0	0	0		0	0	0	0	0	0		0	0	0
	16:45 to 17:00	8	0	8	13	2	15	0	0	0		0	0	0	0	0	0		0	0	0
	17:00 to 17:15	5	0	5	13	4	17	0	0	0		0	0	0	0	0	0		0	0	0
	17:15 to 17:30	1	0	1	6	1	7	0	0	0		0	0	0	0	0	0		0	0	0
	17:30 to 17:45	5	0	5	8	5	13	0	0	0		0	0	0	0	0	0		0	0	0
	17:45 to 18:00	1	0	1	7	1	8	0	0	0		0	0	0	0	0	0		0	0	0
	18:00 to 18:15	0	0	0	8	2	10	0	0	0		0	0	0	0	0	0		0	0	0
	18:15 to 18:30	2	0	2	7	2	9	0	0	0		0	0	0	0	0	0		0	0	0
	<b>PM Totals</b>	<b>113</b>	<b>0</b>	<b>113</b>	<b>333</b>	<b>40</b>	<b>373</b>	0	0	0		0	0	0	0	0	0		0	0	0

Approach	Bradleys Head Rd									Whiting Beach Rd											
	Direction	Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11L (Right Turn)	Direction 12L (Left Turn)			Direction 12U (U Turn)			
		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	
	7:30 to 7:45	12	3	15	7	0	7	1	0	1	0	1	1		2	0	2	0	0	0	0
	7:45 to 8:00	3	1	4	6	1	7	0	1	1	0	1	1		1	1	2	0	0	0	0
	8:00 to 8:15	6	4	10	3	1	4	2	0	2	2	0	2		3	0	3	0	0	0	0
	8:15 to 8:30	6	2	8	6	0	6	1	0	1	7	0	7		6	0	6	0	0	0	0
	8:30 to 8:45	11	2	13	4	0	4	0	0	0	6	1	7		5	0	5	0	0	0	0
	8:45 to 9:00	9	1	10	6	0	6	1	0	1	4	0	4		2	0	2	0	0	0	0
	9:00 to 9:15	17	6	23	6	1	7	2	0	2	4	0	4		2	0	2	0	0	0	0
	9:15 to 9:30	31	3	34	13	1	14	0	0	0	11	2	13		21	0	21	0	0	0	0
	9:30 to 9:45	60	1	61	12	0	12	0	0	0	11	0	11		17	0	17	0	0	0	0
	9:45 to 10:00	63	4	67	13	1	14	0	0	0	13	0	13		28	0	28	0	0	0	0
	10:00 to 10:15	52	2	54	14	0	14	0	0	0	5	0	5		28	0	28	0	0	0	0
	10:15 to 10:30	45	2	47	11	0	11	0	0	0	6	0	6		28	0	28	1	0	1	0
	10:30 to 10:45	43	2	45	10	0	10	0	0	0	7	0	7		34	1	35	0	0	0	0
	10:45 to 11:00	54	4	58	11	0	11	2	0	2	10	0	10		15	1	16	0	0	0	0
	11:00 to 11:15	31	1	32	4	0	4	0	0	0	9	0	9		20	1	21	0	0	0	0
	11:15 to 11:30	31	3	34	9	0	9	1	0	1	3	0	3		16	0	16	0	0	0	0
	<b>AM Totals</b>	<b>474</b>	<b>41</b>	<b>515</b>	<b>135</b>	<b>5</b>	<b>140</b>	<b>10</b>	<b>1</b>	<b>11</b>	<b>100</b>	<b>4</b>	<b>104</b>		<b>7</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
	14:30 to 14:45	14	1	15	4	0	4	1	0	1	3	0	3		3	0	3	0	0	0	0
	14:45 to 15:00	14	2	16	1	0	1	0	0	0	5	0	5		3	0	3	0	0	0	0
	15:00 to 15:15	6	1	7	3	0	3	1	0	1	5	0	5		2	0	2	0	0	0	0
	15:15 to 15:30	3	3	6	2	0	2	0	0	0	5	0	5		2	0	2	0	0	0	0
	15:30 to 15:45	7	2	9	4	1	5	1	0	1	8	0	8		3	0	3	0	0	0	0
	15:45 to 16:00	12	2	14	0	0	0	0	0	0	5	0	5		3	0	3	0	0	0	0
	16:00 to 16:15	8	5	13	6	0	6	2	0	2	4	1	5		2	0	2	0	0	0	0
	16:15 to 16:30	11	4	15	3	0	3	0	0	0	8	0	8		2	0	2	0	0	0	

<b>Job No.</b>	: NS5812
<b>Client</b>	: GTA
<b>Suburb</b>	: Mosman
<b>Location</b>	: 1. Bradleys Head Rd / Whiting Beach Rd
<b>Day/Date</b>	: Thu, 2nd July 2020
<b>Weather</b>	: Fine
<b>Description</b>	Classified Intersection Count
	Hourly Summary

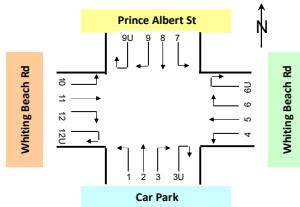


Approach		Bradleys Head Rd									
Direction		Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3U (U Turn)			
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:30 to 8:30	4	1	5	12	10	22		0	0	0	
7:45 to 8:45	7	1	8	14	10	24		0	0	0	
8:00 to 9:00	10	0	10	22	8	30		0	0	0	
8:15 to 9:15	10	0	10	25	11	36		0	0	0	
8:30 to 9:30	12	1	13	30	10	40		0	0	0	
8:45 to 9:45	12	3	15	38	12	50		0	0	0	
9:00 to 10:00	11	3	14	41	12	53		0	0	0	
9:15 to 10:15	11	3	14	47	12	59		0	0	0	
9:30 to 10:30	13	2	15	49	13	62		0	0	0	
9:45 to 10:45	13	0	13	43	13	56		0	0	0	
10:00 to 11:00	16	1	17	44	12	56		0	0	0	
10:15 to 11:15	18	1	19	47	10	57		0	0	0	
10:30 to 11:30	18	1	19	54	9	63		0	0	0	
<b>AM Totals</b>	<b>47</b>	<b>5</b>	<b>52</b>	<b>145</b>	<b>42</b>	<b>187</b>		<b>0</b>	<b>0</b>	<b>0</b>	
14:30 to 15:30	37	0	37	142	8	150		0	0	0	
14:45 to 15:45	38	0	38	127	7	134		0	0	0	
15:00 to 16:00	51	0	51	118	9	127		0	0	0	
15:15 to 16:15	51	0	51	103	11	114		0	0	0	
15:30 to 16:30	47	0	47	104	11	115		0	0	0	
15:45 to 16:45	41	0	41	101	13	114		0	0	0	
16:00 to 17:00	32	0	32	89	12	101		0	0	0	
16:15 to 17:15	27	0	27	73	12	85		0	0	0	
16:30 to 17:30	21	0	21	57	11	68		0	0	0	
16:45 to 17:45	19	0	19	40	12	52		0	0	0	
17:00 to 18:00	12	0	12	34	11	45		0	0	0	
17:15 to 18:15	7	0	7	29	9	38		0	0	0	
17:30 to 18:30	8	0	8	30	10	40		0	0	0	
<b>PM Totals</b>	<b>113</b>	<b>0</b>	<b>113</b>	<b>333</b>	<b>40</b>	<b>373</b>		<b>0</b>	<b>0</b>	<b>0</b>	

Approach	Bradleys Head Rd										Whiting Beach Rd									
Direction	Northbound			Southbound			Northbound			Southbound			Northbound			Southbound				
Time Period	Light	Heves	Total	Light	Heves	Total	Light	Heves	Total	Light	Heves	Total	Light	Heves	Total	Light	Heves	Total		
7:30 to 8:30	27	10	37	22	2	24	4	1	5	11	1	12	12	1	13	0	0	0		
7:45 to 8:45	26	9	35	19	2	21	3	1	4	15	2	17	15	1	16	0	0	0		
8:00 to 9:00	32	9	41	19	1	20	4	0	4	19	1	20	16	0	16	0	0	0		
8:15 to 9:15	43	11	54	22	1	23	4	0	4	21	1	22	15	0	15	0	0	0		
8:30 to 9:30	68	12	80	29	2	31	3	0	3	25	3	28	30	0	30	0	0	0		
8:45 to 9:45	117	11	128	37	2	39	3	0	3	30	2	32	42	0	42	0	0	0		
9:00 to 10:00	171	14	185	44	3	47	2	0	2	39	2	41	68	0	68	0	0	0		
9:15 to 10:15	206	10	216	52	2	54	0	0	0	40	2	42	94	0	94	0	0	0		
9:30 to 10:30	220	9	229	50	1	51	0	0	0	35	0	35	101	0	101	1	0	1		
9:45 to 10:45	203	10	213	48	1	49	0	0	0	31	0	31	118	1	119	1	0	1		
10:00 to 11:00	194	10	204	46	0	46	2	0	2	28	0	28	105	2	107	1	0	1		
10:15 to 11:15	173	9	182	36	0	36	2	0	2	32	0	32	97	3	100	1	0	1		
10:30 to 11:30	159	10	169	34	0	34	3	0	3	29	0	29	85	3	88	0	0	0		
<b>AM Totals</b>	<b>474</b>	<b>41</b>	<b>515</b>	<b>135</b>	<b>5</b>	<b>140</b>	<b>10</b>	<b>1</b>	<b>11</b>	<b>100</b>	<b>4</b>	<b>104</b>	<b>228</b>	<b>4</b>	<b>232</b>	<b>1</b>	<b>1</b>	<b>1</b>		
14:30 to 15:30	37	7	44	10	0	10	2	0	2	18	2	20	15	0	15	0	0	0		
14:45 to 15:45	30	8	38	10	1	11	2	0	2	23	2	25	10	0	10	0	0	0		
15:00 to 16:00	28	8	36	9	1	10	2	0	2	23	2	25	10	0	10	0	0	0		
15:15 to 16:15	30	12	42	17	1	13	3	0	3	22	3	25	10	0	10	0	0	0		
15:30 to 16:30	38	13	51	13	1	14	3	0	3	25	1	26	10	0	10	0	0	0		
15:45 to 16:45	38	13	51	11	1	12	2	0	2	22	1	23	10	0	10	0	0	0		
16:00 to 17:00	32	13	45	14	1	15	3	0	3	23	1	24	8	0	8	0	0	0		
16:15 to 17:15	33	11	44	11	1	12	1	0	1	20	0	20	9	0	9	0	0	0		
16:30 to 17:30	28	10	38	11	1	12	1	0	1	14	1	15	7	0	7	0	0	0		
16:45 to 17:45	27	12	39	9	1	10	1	0	1	11	1	12	6	0	6	0	0	0		
17:00 to 18:00	24	11	35	7	2	9	0	0	0	7	2	9	5	0	5	0	0	0		
17:15 to 18:15	22	10	32	5	2	7	0	0	0	8	2	10	3	0	3	0	0	0		
17:30 to 18:30	19	9	28	2	2	4	0	0	0	8	2	10	3	0	3	0	0	0		
<b>PM Totals</b>	<b>122</b>	<b>39</b>	<b>161</b>	<b>36</b>	<b>4</b>	<b>40</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>65</b>	<b>6</b>	<b>71</b>	<b>35</b>	<b>0</b>	<b>35</b>	<b>0</b>	<b>0</b>	<b>0</b>		



**Job No.** : NS812  
**Client** : GTA  
**Suburb** : Mosman  
**Location** : 2, Whiting Beach Rd / Prince Albert St / Car Park  
  
**Day/Date** : Thu, 2nd July 2020  
**Weather** : Fine  
**Description** : Classified Intersection Count  
  
**: 15 mins Data**

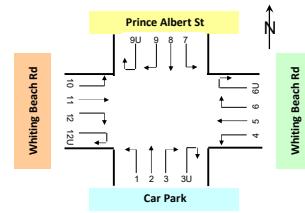


**Class 1** Class 2  
**Classifications** Lights Heavies

Approach	Car Park												Whiting Beach Rd											
	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Direction	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
Time Period																								
7:30 to 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 to 8:00	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	3	1	4	0	0	0	1	1	0
8:00 to 8:15	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	0	2	0	0	2	2	0	0
8:15 to 8:30	0	0	0	1	0	1	2	0	0	2	0	0	0	0	0	5	0	0	0	1	1	2	0	0
8:30 to 8:45	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	3	0	3	0	0	4	0	0	0
8:45 to 9:00	0	0	0	0	2	2	1	0	1	0	0	0	0	0	0	5	0	5	0	0	3	2	0	0
9:00 to 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	1	4	2	0	2	0
9:15 to 9:30	0	0	0	0	1	1	2	3	0	3	0	0	0	0	0	1	0	4	0	4	4	1	5	3
9:30 to 9:45	1	0	1	0	1	1	3	0	3	0	0	0	0	0	0	3	2	5	0	3	11	0	11	0
9:45 to 10:00	0	0	0	2	1	3	4	0	4	0	0	0	0	0	0	2	1	0	1	9	1	10	2	0
10:00 to 10:15	0	0	0	1	0	1	2	0	2	0	0	0	0	0	0	2	0	4	0	11	0	11	1	0
10:15 to 10:30	0	0	0	1	1	2	2	0	0	2	0	0	0	0	0	1	0	5	0	10	0	0	0	0
10:30 to 10:45	0	0	0	1	3	4	2	0	2	0	0	0	0	0	0	1	0	6	0	6	5	0	5	2
10:45 to 11:00	0	0	0	4	0	4	2	1	3	0	0	0	0	0	0	2	0	4	0	6	1	7	2	0
11:00 to 11:15	0	0	0	1	0	1	2	1	3	0	0	0	0	0	0	1	0	1	0	6	0	6	1	0
11:15 to 11:30	0	0	0	4	0	4	1	0	1	0	0	0	0	0	0	1	0	2	0	8	0	8	0	0
<b>AM Totals</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>17</b>	<b>10</b>	<b>27</b>	<b>27</b>	<b>3</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>3</b>	<b>40</b>	<b>38</b>	<b>0</b>	<b>38</b>	<b>87</b>	<b>6</b>	<b>93</b>	<b>14</b>	<b>1</b>	<b>15</b>
14:30 to 14:45	0	0	0	14	0	14	0	0	0	0	0	0	1	0	1	2	0	2	11	0	11	0	0	0
14:45 to 15:00	0	0	0	12	0	12	1	0	1	0	0	0	0	0	0	1	0	1	5	0	5	0	0	0
15:00 to 15:15	0	0	0	12	0	12	2	0	2	0	0	0	0	0	0	2	0	2	12	0	12	0	0	0
15:15 to 15:30	0	0	0	12	0	12	1	0	1	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0
15:30 to 15:45	0	0	0	18	0	18	2	0	2	0	0	0	1	0	1	2	0	2	15	1	16	0	0	0
15:45 to 16:00	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0
16:00 to 16:15	0	0	0	22	0	22	1	0	1	0	0	0	0	0	0	3	0	3	12	0	12	0	0	0
16:15 to 16:30	0	0	0	21	0	21	1	0	1	0	0	0	0	0	0	1	0	1	9	0	9	0	0	0
16:30 to 16:45	0	0	0	9	0	9	2	0	2	0	0	0	0	0	0	0	0	0	8	1	9	0	0	0
16:45 to 17:00	0	0	0	11	0	11	2	0	2	0	0	0	0	0	0	4	0	4	8	0	8	0	0	0
17:00 to 17:15	0	0	0	18	1	19	0	0	0	0	0	0	0	0	0	4	0	4	4	0	4	4	0	0
17:15 to 17:30	0	0	0	13	0	13	1	0	1	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0
17:30 to 17:45	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6	1	7	0	0	0
17:45 to 18:00	0	0	0	7	0	7	1	0	1	0	0	0	0	0	0	1	0	2	2	0	2	0	0	0
18:00 to 18:15	0	0	0	4	0	4	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
18:15 to 18:30	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0
<b>PM Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>185</b>	<b>1</b>	<b>186</b>	<b>15</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>22</b>	<b>1</b>	<b>23</b>	<b>123</b>	<b>3</b>	<b>126</b>	<b>0</b>	<b>0</b>	<b>0</b>

Approach	Prince Albert St												Whiting Beach Rd											
	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Direction	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
Time Period																								
7:30 to 7:45	3	0	3	9	2	11	3	0	3	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
7:45 to 8:00	0	1	1	4	0	4	4	0	4	0	0	0	0	0	0	3	0	3	0	1	0	0	0	0
8:00 to 8:15	3	0	3	9	0	9	4	0	4	2	0	2	0	0	0	1	0	1	0	1	0	0	0	0
8:15 to 8:30	7	0	7	14	1	15	4	0	4	7	0	7	3	0	3	4	0	4	0	0	0	0	0	0
8:30 to 8:45	6	1	7	8	1	9	1	0	1	1	0	1	1	0	0	2	0	2	0	0	0	0	0	0
8:45 to 9:00	6	1	6	16	1	17	4	0	4	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
9:00 to 9:15	4	0	4	7	1	8	9	0	9	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0
9:15 to 9:30	24	1	25	5	1	6	6	0	6	3	0	3	3	0	3	2	0	2	1	0	1	0	0	0
9:30 to 9:45	22	0	22	3	0	3	2	0	2	5	0	5	1	0	1	1	0	1	0	0	0	0	0	0
9:45 to 10:00	40	0	40	2	0	2	8	0	8	3	1	4	3	0	3	0	0	0	0	0	0	0	0	0
10:00 to 10:15	25	0	25	0	1	1	3	0	3	10	0	10	0	3	0	3	2	0	2	0	0	0	0	0
10:15 to 10:30	32	0	32	0	2	2	9	1	10	3	0	3	3	0	3	3	0	3	0	0	0	0	0	0
10:30 to 10:45	36	1	37	0	1	1	3	0	3	4	0	4	3	0	3	2	0	2	0	0	0	0	0	0
10:45 to 11:00	17	0	17	0	0	0	4	0	4	2	0	2	2	0	2	2	0	2	0					

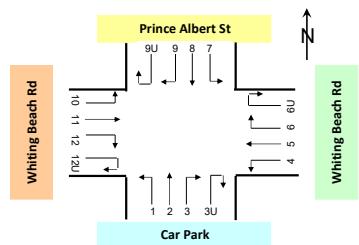
**Job No.** : N5812  
**Client** : GTA  
**Suburb** : Mosman  
**Location** : 2. Whiting Beach Rd / Prince Albert St / Car Park  
  
**Day/Date** : Thu, 2nd July 2020  
**Weather** : Fine  
**Description** : Classified Intersection Count  
Hourly Summary



Approach	Car Park												Whiting Beach Rd												
	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)			
Direction	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
Time Period																									
7:30 to 8:30	0	0	0	1	1	2	3	1	4	0	0	0	13	1	14	4	2	6	10	1	0	1	0	1	
7:45 to 8:45	0	0	0	2	1	3	5	1	6	0	0	0	13	1	14	2	0	2	10	1	0	1	0	1	
8:00 to 9:00	0	0	0	2	2	4	6	0	6	0	0	0	15	0	15	5	0	5	9	1	0	0	0	0	
8:15 to 9:15	0	0	0	2	2	4	5	0	5	0	0	0	15	0	15	4	0	4	10	2	12	2	0	2	
8:30 to 9:30	0	0	0	2	3	5	6	0	6	0	0	0	11	0	11	8	0	8	13	2	15	5	1	6	
8:45 to 9:45	1	0	1	1	4	5	7	0	7	0	0	0	11	2	13	11	0	11	20	2	22	5	1	6	
9:00 to 10:00	1	0	1	3	3	6	10	0	10	0	0	0	8	2	10	9	0	9	27	3	30	7	1	8	
9:15 to 10:15	1	0	1	4	3	7	12	0	12	0	0	0	8	2	10	12	0	12	35	2	37	6	1	7	
9:30 to 10:30	1	0	1	4	3	7	11	0	11	0	0	0	8	2	10	13	0	13	41	1	42	3	0	3	
9:45 to 10:45	0	0	0	5	5	10	10	0	10	0	0	0	6	0	6	16	0	16	35	1	36	5	0	5	
10:00 to 11:00	0	0	0	7	4	11	8	1	9	0	0	0	6	0	6	19	0	19	32	1	33	5	0	5	
10:15 to 11:15	0	0	0	7	4	11	8	2	10	0	0	0	5	0	5	16	0	16	27	1	28	5	0	5	
10:30 to 11:30	0	0	0	10	3	13	7	2	9	0	0	0	5	0	5	13	0	13	25	1	26	5	0	5	
<b>AM Totals</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>17</b>	<b>10</b>	<b>27</b>	<b>27</b>	<b>3</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>3</b>	<b>40</b>	<b>38</b>	<b>0</b>	<b>38</b>	<b>87</b>	<b>6</b>	<b>93</b>	<b>14</b>	<b>1</b>	<b>15</b>	
14:30 to 15:30	0	0	0	50	0	50	4	0	4	0	0	0	1	0	1	5	0	5	39	0	39	0	0	0	
14:45 to 15:45	0	0	0	54	0	54	6	0	6	0	0	0	1	0	1	5	0	5	43	1	44	0	0	0	
15:00 to 16:00	0	0	0	48	0	48	5	0	5	0	0	0	1	0	1	4	0	4	55	1	56	0	0	0	
15:15 to 16:15	0	0	0	58	0	58	4	0	4	0	0	0	1	0	1	5	0	5	55	1	56	0	0	0	
15:30 to 16:30	0	0	0	67	0	67	4	0	4	0	0	0	1	0	1	6	0	6	53	1	54	0	0	0	
15:45 to 16:45	0	0	0	58	0	58	4	0	4	0	0	0	0	0	0	4	0	4	46	1	47	0	0	0	
16:00 to 17:00	0	0	0	63	0	63	6	0	6	0	0	0	0	0	0	8	0	8	37	1	38	0	0	0	
16:15 to 17:15	0	0	0	59	1	60	5	0	5	0	0	0	0	0	0	9	0	9	29	1	30	0	0	0	
16:30 to 17:30	0	0	0	51	1	52	5	0	5	0	0	0	0	0	0	9	0	9	21	1	22	0	0	0	
16:45 to 17:45	0	0	0	45	1	46	3	0	3	0	0	0	0	0	0	9	0	9	19	1	20	0	0	0	
17:00 to 18:00	0	0	0	41	1	42	2	0	2	0	0	0	0	0	0	6	1	7	13	1	14	0	0	0	
17:15 to 18:15	0	0	0	27	0	27	3	0	3	0	0	0	0	0	0	3	1	4	9	1	10	0	0	0	
17:30 to 18:30	0	0	0	17	0	17	2	0	2	0	0	0	0	0	0	2	1	3	10	1	11	0	0	0	
<b>PM Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>185</b>	<b>1</b>	<b>186</b>	<b>15</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>22</b>	<b>1</b>	<b>23</b>	<b>123</b>	<b>3</b>	<b>126</b>	<b>0</b>	<b>0</b>	<b>0</b>	

Approach	Prince Albert St												Whiting Beach Rd												
	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)			
Direction	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
Time Period																									
7:30 to 8:30	13	1	14	36	3	39	15	0	15	9	0	9	5	0	5	7	0	7	0	0	0	0	0	0	0
7:45 to 8:45	16	2	18	35	2	37	13	0	13	10	0	10	6	0	6	7	0	7	0	0	0	0	0	0	0
8:00 to 9:00	22	1	23	47	3	50	13	0	13	10	0	10	6	0	6	7	0	7	0	0	0	0	0	0	0
8:15 to 9:15	23	1	24	45	4	49	18	0	18	8	0	8	11	0	11	6	0	6	0	0	0	0	0	0	0
8:30 to 9:30	40	2	42	36	4	40	20	0	20	4	0	4	11	0	11	4	0	4	1	0	1	0	0	0	0
8:45 to 9:45	56	1	57	31	3	34	21	0	21	8	0	8	11	0	11	3	0	3	1	0	1	0	0	0	0
9:00 to 10:00	90	1	91	17	2	19	25	0	25	11	1	12	12	0	12	3	0	3	1	0	1	0	0	0	0
9:15 to 10:15	111	1	112	10	2	12	19	0	19	21	1	22	10	0	10	5	0	5	1	0	1	0	0	0	0
9:30 to 10:30	116	0	119	5	3	8	22	1	23	21	1	22	10	0	10	6	0	6	0	0	0	0	0	0	0
9:45 to 10:45	133	1	134	2	4	6	23	1	24	20	1	21	12	0	12	7	0	7	0	0	0	0	0	0	0
10:00 to 11:00	110	1	111	0	4	4	19	1	20	19	0	19	11	0	11	9	0	9	0	0	0	0	0	0	0
10:15 to 11:15	110	1	111	3	3	6	20	1	21	11	0	11	11	0	11	7	0	7	0	0	0	0	0	0	0
10:30 to 11:30	93	1	94	3	1	4	22	0	22	11	0	11	12	0	12	6	0	6	1	0	1	0	0	0	0
<b>AM Totals</b>	<b>265</b>	<b>4</b>	<b>269</b>	<b>80</b>	<b>11</b>	<b>91</b>	<b>79</b>	<b>1</b>	<b>80</b>	<b>45</b>	<b>1</b>	<b>46</b>	<b>38</b>	<b>0</b>	<b>38</b>	<b>23</b>	<b>0</b>	<b>23</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
14:30 to 15:30	16	2	18	3	1	4	19	0	19	9	0	9	13	1	14	8	0	8	0	0	0	1	0	1	1
14:45 to 15:45	17	2	19	1	1	2	18	0	18	9	0	9	13	1	14	8	0	8	0	0	0	0	0	0	0
15:00 to 16:00	18	2	20	0	1	1	17	0	17	9	0	9	13	1	14	8	0	8	0	0	0	0	0	0	0
15:15 to 16:15	19	3	22	1	1	2	11	0	11	9	0	9	14	1</											

**Job No.** : N5812  
**Client** : GTA  
**Suburb** : Mosman  
**Location** : 2. Whiting Beach Rd / Prince Albert St / Car Park  
  
**Day/Date** : Sat, 4th July 2020  
**Weather** : Fine  
**Description** : Classified Intersection Count  
  
**: 15 mins Data**



**Classifications**  
**Class 1** Lights      **Class 2** Heavies

Approach	Car Park												Whiting Beach Rd												
	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)			
Direction	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
Time Period																									
9:00 to 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0
9:15 to 9:30	0	0	0	1	0	1	2	0	2	0	0	0	0	1	1	2	4	1	5	2	0	2	2	0	2
9:30 to 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	3	13	0	13	0	0	0	0	0
9:45 to 10:00	1	0	1	0	1	1	0	0	0	0	0	0	0	0	1	0	1	6	0	6	1	0	1	0	1
10:00 to 10:15	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	3	4	0	4	0	0
10:15 to 10:30	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	1	6	0	6	0	0	0	0	0
10:30 to 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0
10:45 to 11:00	0	0	0	1	0	1	1	0	1	0	0	0	0	1	1	0	1	4	0	4	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>15</b>	<b>1</b>	<b>16</b>	<b>46</b>	<b>0</b>	<b>46</b>	<b>3</b>	<b>0</b>	<b>3</b>

Approach	Prince Albert St												Whiting Beach Rd												
	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)			
Direction	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
Time Period																									
9:00 to 9:15	7	0	7	1	0	1	4	0	4	3	0	3	2	0	2	1	0	1	0	0	0	0	0	0	0
9:15 to 9:30	19	0	19	2	0	2	3	0	3	3	0	3	0	0	0	0	1	0	1	0	0	0	0	0	0
9:30 to 9:45	27	0	27	2	0	2	4	0	4	4	0	4	0	0	0	0	1	0	1	0	0	0	0	0	0
9:45 to 10:00	21	0	21	2	0	2	3	0	3	3	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0
10:00 to 10:15	34	1	35	1	0	1	8	0	8	3	0	3	2	0	2	2	0	2	0	0	0	0	0	0	0
10:15 to 10:30	40	0	40	0	0	0	4	0	4	6	0	6	5	0	5	0	0	0	0	0	0	0	0	0	0
10:30 to 10:45	25	1	26	2	0	2	8	0	8	5	0	5	1	0	1	0	0	0	0	0	0	0	0	0	0
10:45 to 11:00	47	0	47	1	0	1	6	0	6	2	0	2	4	0	4	1	0	1	0	0	0	0	0	0	0
<b>Total</b>	<b>220</b>	<b>2</b>	<b>222</b>	<b>11</b>	<b>0</b>	<b>11</b>	<b>40</b>	<b>0</b>	<b>40</b>	<b>29</b>	<b>0</b>	<b>29</b>	<b>17</b>	<b>0</b>	<b>17</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Approach	Car Park												Whiting Beach Rd													
	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)				
Direction	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		
Time Period																										
9:00 to 10:00	1	0	1	1	1	2	2	0	2	0	0	0	0	2	1	3	10	1	11	27	0	27	3	0	3	
9:15 to 10:15	1	0	1	2	1	3	2	0	2	0	0	0	0	2	1	3	11	1	12	25	0	25	3	0	3	
9:30 to 10:30	1	0	1	2	1	3	0	0	0	0	0	0	0	2	0	2	z	8	0	8	29	0	29	1	0	1
9:45 to 10:45	1	0	1	2	1	3	0	0	0	0	0	0	0	1	0	1	5	0	5	21	0	21	1	0	1	
10:00 to 11:00	0	0	0	3	0	3	1	0	1	0	0	0	0	2	0	2	5	0	5	19	0	19	0	0	0	
<b>Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>15</b>	<b>1</b>	<b>16</b>	<b>46</b>	<b>0</b>	<b>46</b>	<b>3</b>	<b>0</b>	<b>3</b>	

Approach	Prince Albert St												Whiting Beach Rd												
	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)			
Direction	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
Time Period																									
9:00 to 10:00	74	0	74	7	0	7	14	0	14	13	0	13	5	0	5	3	0	3	0	0	0	0	0	0	0
9:15 to 10:15	101	1	102	7	0	7	18	0	18	13	0	13	5	0	5	4	0	4	0	4	0	0	0	0	0
9:30 to 10:30	122	1	123	5	0	5	19	0	19	16	0	16	10	0	10	3	0	3	0	0	0	0	0	0	0
9:45 to 10:45	120	2	122	5	0	5	23	0	23	17	0	17	11	0	11	2	0	2	0	2	0	0	0	0	0
10:00 to 11:00	146	2	148	4	0	4	26	0	26	16	0	16	12	0	12	3	0	3	0	0	0	0	0	0	0
<b>Total</b>	<b>220</b>	<b></b>																							

## D. SIDRA RESULTS

D

# USER REPORT FOR SITE

 Project: 2007013sid-N192210 Taronga Zoo

Template: Default Site User Report

## ▼ Site: 1 [1. Whiting Beach Rd/ Bradleys Head Rd - AM]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
<b>South: Bradleys Head Road</b>												
1	L2	16	13.3	0.047	4.7	LOS A	0.0	0.0	0.00	0.11	0.00	47.4
2	T1	65	21.0	0.047	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	49.1
Approach		81	19.5	0.047	0.9	NA	0.0	0.0	0.00	0.11	0.00	48.8
<b>North: Bradleys Head Road</b>												
8	T1	241	3.9	0.160	0.1	LOS A	0.4	2.6	0.08	0.10	0.08	48.9
9	R2	54	2.0	0.160	4.9	LOS A	0.4	2.6	0.08	0.10	0.08	45.1
Approach		295	3.6	0.160	1.0	NA	0.4	2.6	0.08	0.10	0.08	48.5
<b>West: Whiting Beach Road</b>												
10	L2	37	0.0	0.141	4.8	LOS A	0.5	3.5	0.24	0.59	0.24	39.8
12	R2	106	0.0	0.141	6.3	LOS A	0.5	3.5	0.24	0.59	0.24	43.0
Approach		143	0.0	0.141	5.9	LOS A	0.5	3.5	0.24	0.59	0.24	42.4
All Vehicles		519	5.1	0.160	2.3	NA	0.5	3.5	0.11	0.24	0.11	47.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 1 [1. Whiting Beach Rd/ Bradleys Head Rd - AM - Post Dev]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay sec v/c	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Bradleys Head Road</b>												
1	L2	16	13.3	0.047	4.7	LOS A	0.0	0.0	0.00	0.11	0.00	47.4
2	T1	65	21.0	0.047	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	49.1
Approach		81	19.5	0.047	0.9	NA	0.0	0.0	0.00	0.11	0.00	48.8
<b>North: Bradleys Head Road</b>												
8	T1	259	3.7	0.169	0.1	LOS A	0.4	2.6	0.08	0.10	0.08	49.0
9	R2	54	2.0	0.169	4.9	LOS A	0.4	2.6	0.08	0.10	0.08	45.2
Approach		313	3.4	0.169	0.9	NA	0.4	2.6	0.08	0.10	0.08	48.6
<b>West: Whiting Beach Road</b>												
10	L2	37	0.0	0.143	4.8	LOS A	0.5	3.6	0.24	0.59	0.24	39.7
12	R2	106	0.0	0.143	6.4	LOS A	0.5	3.6	0.24	0.59	0.24	42.9
Approach		143	0.0	0.143	6.0	LOS A	0.5	3.6	0.24	0.59	0.24	42.3
All Vehicles		537	4.9	0.169	2.3	NA	0.5	3.6	0.11	0.23	0.11	47.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 1 [1. Whiting Beach Rd/ Bradleys Head Rd - PM]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay sec v/c	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Bradleys Head Road</b>												
1	L2	49	0.0	0.093	4.6	LOS A	0.0	0.0	0.00	0.16	0.00	47.7
2	T1	121	9.6	0.093	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	48.7
Approach		171	6.8	0.093	1.3	NA	0.0	0.0	0.00	0.16	0.00	48.4
<b>North: Bradleys Head Road</b>												
8	T1	54	25.5	0.042	0.2	LOS A	0.1	0.8	0.13	0.12	0.13	48.5
9	R2	15	7.1	0.042	5.2	LOS A	0.1	0.8	0.13	0.12	0.13	43.9
Approach		68	21.5	0.042	1.3	NA	0.1	0.8	0.13	0.12	0.13	47.9
<b>West: Whiting Beach Road</b>												
10	L2	27	3.8	0.029	5.0	LOS A	0.1	0.8	0.22	0.52	0.22	40.3
12	R2	11	0.0	0.029	5.4	LOS A	0.1	0.8	0.22	0.52	0.22	43.4
Approach		38	2.8	0.029	5.1	LOS A	0.1	0.8	0.22	0.52	0.22	41.4
All Vehicles		277	9.9	0.093	1.8	NA	0.1	0.8	0.06	0.20	0.06	47.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 1 [1. Whiting Beach Rd/ Bradleys Head Rd - PM - Post Dev]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay sec v/c	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Bradleys Head Road</b>												
1	L2	49	0.0	0.102	4.6	LOS A	0.0	0.0	0.00	0.14	0.00	47.9
2	T1	139	8.3	0.102	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	48.8
Approach		188	6.1	0.102	1.2	NA	0.0	0.0	0.00	0.14	0.00	48.6
<b>North: Bradleys Head Road</b>												
8	T1	73	18.8	0.052	0.2	LOS A	0.1	0.8	0.11	0.10	0.11	48.8
9	R2	15	7.1	0.052	5.3	LOS A	0.1	0.8	0.11	0.10	0.11	44.4
Approach		87	16.9	0.052	1.0	NA	0.1	0.8	0.11	0.10	0.11	48.4
<b>West: Whiting Beach Road</b>												
10	L2	27	3.8	0.030	5.0	LOS A	0.1	0.8	0.24	0.52	0.24	40.2
12	R2	11	0.0	0.030	5.5	LOS A	0.1	0.8	0.24	0.52	0.24	43.3
Approach		38	2.8	0.030	5.2	LOS A	0.1	0.8	0.24	0.52	0.24	41.4
All Vehicles		314	8.7	0.102	1.6	NA	0.1	0.8	0.06	0.18	0.06	47.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 1 [1. Whiting Beach Rd/ Bradleys Head Rd - Sat]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay sec v/c	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Bradleys Head Road</b>												
1	L2	12	9.1	0.031	4.6	LOS A	0.0	0.0	0.00	0.11	0.00	47.6
2	T1	43	17.1	0.031	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	49.0
Approach		55	15.4	0.031	1.0	NA	0.0	0.0	0.00	0.11	0.00	48.8
<b>North: Bradleys Head Road</b>												
8	T1	246	3.0	0.149	0.0	LOS A	0.2	1.6	0.04	0.07	0.04	49.3
9	R2	33	3.2	0.149	4.8	LOS A	0.2	1.6	0.04	0.07	0.04	45.8
Approach		279	3.0	0.149	0.6	NA	0.2	1.6	0.04	0.07	0.04	49.1
<b>West: Whiting Beach Road</b>												
10	L2	20	5.3	0.109	4.8	LOS A	0.4	2.6	0.21	0.58	0.21	39.8
12	R2	91	0.0	0.109	6.0	LOS A	0.4	2.6	0.21	0.58	0.21	43.1
Approach		111	1.0	0.109	5.7	LOS A	0.4	2.6	0.21	0.58	0.21	42.7
All Vehicles		444	4.0	0.149	1.9	NA	0.4	2.6	0.08	0.20	0.08	47.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 1 [1. Whiting Beach Rd/ Bradleys Head Rd - Sat - Post Dev]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay sec v/c	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Bradleys Head Road</b>												
1	L2	12	9.1	0.038	4.6	LOS A	0.0	0.0	0.00	0.09	0.00	47.8
2	T1	57	13.0	0.038	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	49.3
Approach		68	12.3	0.038	0.8	NA	0.0	0.0	0.00	0.09	0.00	49.0
<b>North: Bradleys Head Road</b>												
8	T1	278	2.7	0.165	0.0	LOS A	0.2	1.6	0.04	0.06	0.04	49.4
9	R2	33	3.2	0.165	4.8	LOS A	0.2	1.6	0.04	0.06	0.04	45.9
Approach		311	2.7	0.165	0.5	NA	0.2	1.6	0.04	0.06	0.04	49.2
<b>West: Whiting Beach Road</b>												
10	L2	20	5.3	0.113	4.8	LOS A	0.4	2.7	0.25	0.60	0.25	39.5
12	R2	91	0.0	0.113	6.2	LOS A	0.4	2.7	0.25	0.60	0.25	42.9
Approach		111	1.0	0.113	6.0	LOS A	0.4	2.7	0.25	0.60	0.25	42.5
All Vehicles		489	3.7	0.165	1.8	NA	0.4	2.7	0.08	0.18	0.08	47.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 2 [2. Whiting Beach Rd/ Prince Albert St - AM]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay sec v/c	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Taronga Zoo Access</b>												
1	L2	1	0.0	0.021	0.0	LOS A	0.1	0.6	0.16	0.15	0.16	33.9
2	T1	7	42.9	0.021	0.4	LOS A	0.1	0.6	0.16	0.15	0.16	42.6
3	R2	12	0.0	0.021	1.6	LOS A	0.1	0.6	0.16	0.15	0.16	31.6
Approach		20	15.8	0.021	1.1	LOS A	0.1	0.6	0.16	0.15	0.16	38.5
<b>East: Whiting Beach Road</b>												
4	L2	11	20.0	0.039	4.8	LOS A	0.2	1.3	0.07	0.42	0.07	31.4
5	T1	14	0.0	0.039	0.0	LOS A	0.2	1.3	0.07	0.42	0.07	40.9
6	R2	44	2.4	0.039	4.6	LOS A	0.2	1.3	0.07	0.42	0.07	44.6
Approach		68	4.6	0.039	3.7	NA	0.2	1.3	0.07	0.42	0.07	43.4
<b>North: Prince Albert Street</b>												
7	L2	125	0.0	0.109	4.6	LOS A	0.4	3.2	0.03	0.52	0.03	44.7
8	T1	8	37.5	0.109	4.8	LOS A	0.4	3.2	0.03	0.52	0.03	42.5
9	R2	24	4.3	0.109	5.0	LOS A	0.4	3.2	0.03	0.52	0.03	43.9
Approach		158	2.7	0.109	4.7	LOS A	0.4	3.2	0.03	0.52	0.03	44.4
<b>West: Whiting Beach Road</b>												
10	L2	11	0.0	0.010	4.6	LOS A	0.0	0.1	0.02	0.34	0.02	46.2
11	T1	6	0.0	0.010	0.0	LOS A	0.0	0.1	0.02	0.34	0.02	42.7
12	R2	1	0.0	0.010	4.6	LOS A	0.0	0.1	0.02	0.34	0.02	38.3
Approach		18	0.0	0.010	3.0	NA	0.0	0.1	0.02	0.34	0.02	45.3
All Vehicles		264	4.0	0.109	4.0	NA	0.4	3.2	0.05	0.46	0.05	44.0

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 2 [2. Whiting Beach Rd/ Prince Albert St - AM - Post Dev]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m			km/h	
<b>South: Taronga Zoo Access</b>												
1	L2	1	0.0	0.021	0.0	LOS A	0.1	0.6	0.16	0.15	0.16	33.8
2	T1	7	42.9	0.021	0.4	LOS A	0.1	0.6	0.16	0.15	0.16	42.6
3	R2	12	0.0	0.021	1.6	LOS A	0.1	0.6	0.16	0.15	0.16	31.6
Approach		20	15.8	0.021	1.1	LOS A	0.1	0.6	0.16	0.15	0.16	38.5
<b>East: Whiting Beach Road</b>												
4	L2	11	20.0	0.039	4.8	LOS A	0.2	1.3	0.07	0.42	0.07	31.4
5	T1	14	0.0	0.039	0.0	LOS A	0.2	1.3	0.07	0.42	0.07	40.9
6	R2	44	2.4	0.039	4.6	LOS A	0.2	1.3	0.07	0.42	0.07	44.6
Approach		68	4.6	0.039	3.7	NA	0.2	1.3	0.07	0.42	0.07	43.4
<b>North: Prince Albert Street</b>												
7	L2	125	0.0	0.112	4.6	LOS A	0.5	3.3	0.03	0.52	0.03	44.7
8	T1	13	25.0	0.112	4.6	LOS A	0.5	3.3	0.03	0.52	0.03	42.5
9	R2	24	4.3	0.112	5.0	LOS A	0.5	3.3	0.03	0.52	0.03	43.9
Approach		162	2.6	0.112	4.7	LOS A	0.5	3.3	0.03	0.52	0.03	44.4
<b>West: Whiting Beach Road</b>												
10	L2	11	0.0	0.010	4.6	LOS A	0.0	0.1	0.02	0.34	0.02	46.2
11	T1	6	0.0	0.010	0.0	LOS A	0.0	0.1	0.02	0.34	0.02	42.7
12	R2	1	0.0	0.010	4.6	LOS A	0.0	0.1	0.02	0.34	0.02	38.3
Approach		18	0.0	0.010	3.0	NA	0.0	0.1	0.02	0.34	0.02	45.3
All Vehicles		268	3.9	0.112	4.0	NA	0.5	3.3	0.05	0.46	0.05	44.0

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 2 [2. Whiting Beach Rd/ Prince Albert St - PM]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h	
<b>South: Taronga Zoo Access</b>												
1	L2	1	0.0	0.062	0.0	LOS A	0.2	1.6	0.16	0.07	0.16	35.1
2	T1	71	0.0	0.062	0.3	LOS A	0.2	1.6	0.16	0.07	0.16	44.2
3	R2	4	0.0	0.062	1.0	LOS A	0.2	1.6	0.16	0.07	0.16	32.8
Approach		76	0.0	0.062	0.4	LOS A	0.2	1.6	0.16	0.07	0.16	43.9
<b>East: Whiting Beach Road</b>												
4	L2	1	0.0	0.037	4.7	LOS A	0.2	1.2	0.09	0.48	0.09	30.3
5	T1	6	0.0	0.037	0.1	LOS A	0.2	1.2	0.09	0.48	0.09	39.8
6	R2	57	1.9	0.037	4.6	LOS A	0.2	1.2	0.09	0.48	0.09	44.1
Approach		64	1.6	0.037	4.2	NA	0.2	1.2	0.09	0.48	0.09	43.9
<b>North: Prince Albert Street</b>												
7	L2	24	4.3	0.034	4.6	LOS A	0.1	0.9	0.02	0.53	0.02	44.3
8	T1	1	0.0	0.034	4.3	LOS A	0.1	0.9	0.02	0.53	0.02	42.3
9	R2	18	0.0	0.034	5.2	LOS A	0.1	0.9	0.02	0.53	0.02	43.9
Approach		43	2.4	0.034	4.9	LOS A	0.1	0.9	0.02	0.53	0.02	44.1
<b>West: Whiting Beach Road</b>												
10	L2	17	6.3	0.013	4.6	LOS A	0.0	0.1	0.01	0.39	0.01	45.8
11	T1	6	0.0	0.013	0.0	LOS A	0.0	0.1	0.01	0.39	0.01	42.0
12	R2	1	0.0	0.013	4.6	LOS A	0.0	0.1	0.01	0.39	0.01	37.5
Approach		24	4.3	0.013	3.4	NA	0.0	0.1	0.01	0.39	0.01	45.1
All Vehicles		207	1.5	0.062	2.8	NA	0.2	1.6	0.09	0.33	0.09	44.1

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 2 [2. Whiting Beach Rd/ Prince Albert St - PM - Post Dev]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay sec v/c	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Taronga Zoo Access</b>												
1	L2	1	0.0	0.065	0.0	LOS A	0.2	1.7	0.16	0.07	0.16	35.1
2	T1	75	0.0	0.065	0.3	LOS A	0.2	1.7	0.16	0.07	0.16	44.2
3	R2	4	0.0	0.065	1.1	LOS A	0.2	1.7	0.16	0.07	0.16	32.7
Approach		80	0.0	0.065	0.4	LOS A	0.2	1.7	0.16	0.07	0.16	43.9
<b>East: Whiting Beach Road</b>												
4	L2	1	0.0	0.037	4.7	LOS A	0.2	1.2	0.09	0.48	0.09	30.3
5	T1	6	0.0	0.037	0.1	LOS A	0.2	1.2	0.09	0.48	0.09	39.8
6	R2	57	1.9	0.037	4.6	LOS A	0.2	1.2	0.09	0.48	0.09	44.1
Approach		64	1.6	0.037	4.2	NA	0.2	1.2	0.09	0.48	0.09	43.9
<b>North: Prince Albert Street</b>												
7	L2	24	4.3	0.035	4.6	LOS A	0.1	0.9	0.02	0.53	0.02	44.2
8	T1	1	0.0	0.035	4.3	LOS A	0.1	0.9	0.02	0.53	0.02	42.3
9	R2	18	0.0	0.035	5.3	LOS A	0.1	0.9	0.02	0.53	0.02	43.9
Approach		43	2.4	0.035	4.9	LOS A	0.1	0.9	0.02	0.53	0.02	44.1
<b>West: Whiting Beach Road</b>												
10	L2	17	6.3	0.013	4.6	LOS A	0.0	0.1	0.01	0.39	0.01	45.8
11	T1	6	0.0	0.013	0.0	LOS A	0.0	0.1	0.01	0.39	0.01	42.0
12	R2	1	0.0	0.013	4.6	LOS A	0.0	0.1	0.01	0.39	0.01	37.5
Approach		24	4.3	0.013	3.4	NA	0.0	0.1	0.01	0.39	0.01	45.1
All Vehicles		212	1.5	0.065	2.8	NA	0.2	1.7	0.09	0.33	0.09	44.1

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 2 [2. Whiting Beach Rd/ Prince Albert St - Sat]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Taronga Zoo Access</b>												
1	L2	1	0.0	0.006	0.0	LOS A	0.0	0.2	0.09	0.07	0.09	34.9
2	T1	3	33.3	0.006	0.2	LOS A	0.0	0.2	0.09	0.07	0.09	43.3
3	R2	2	0.0	0.006	1.3	LOS A	0.0	0.2	0.09	0.07	0.09	32.6
Approach		6	16.7	0.006	0.6	LOS A	0.0	0.2	0.09	0.07	0.09	40.7
<b>East: Whiting Beach Road</b>												
4	L2	3	33.3	0.023	4.9	LOS A	0.1	0.8	0.05	0.38	0.05	32.2
5	T1	13	8.3	0.023	0.0	LOS A	0.1	0.8	0.05	0.38	0.05	41.8
6	R2	26	0.0	0.023	4.6	LOS A	0.1	0.8	0.05	0.38	0.05	45.1
Approach		42	5.0	0.023	3.2	NA	0.1	0.8	0.05	0.38	0.05	44.2
<b>North: Prince Albert Street</b>												
7	L2	107	1.0	0.090	4.6	LOS A	0.4	2.6	0.02	0.52	0.02	44.6
8	T1	7	0.0	0.090	4.2	LOS A	0.4	2.6	0.02	0.52	0.02	42.5
9	R2	19	0.0	0.090	4.8	LOS A	0.4	2.6	0.02	0.52	0.02	44.1
Approach		134	0.8	0.090	4.6	LOS A	0.4	2.6	0.02	0.52	0.02	44.5
<b>West: Whiting Beach Road</b>												
10	L2	5	0.0	0.006	4.6	LOS A	0.0	0.1	0.02	0.32	0.02	46.4
11	T1	4	0.0	0.006	0.0	LOS A	0.0	0.1	0.02	0.32	0.02	43.1
12	R2	1	0.0	0.006	4.6	LOS A	0.0	0.1	0.02	0.32	0.02	38.9
Approach		11	0.0	0.006	2.7	NA	0.0	0.1	0.02	0.32	0.02	45.3
All Vehicles		193	2.2	0.090	4.1	NA	0.4	2.6	0.03	0.47	0.03	44.4

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

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## ▼ Site: 2 [2. Whiting Beach Rd/ Prince Albert St - Sat - Post Dev]

Site Category: -  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. Satn HV %	Average Delay sec v/c	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
<b>South: Taronga Zoo Access</b>												
1	L2	1	0.0	0.006	0.0	LOS A	0.0	0.2	0.09	0.07	0.09	34.9
2	T1	3	33.3	0.006	0.2	LOS A	0.0	0.2	0.09	0.07	0.09	43.3
3	R2	2	0.0	0.006	1.3	LOS A	0.0	0.2	0.09	0.07	0.09	32.6
Approach		6	16.7	0.006	0.6	LOS A	0.0	0.2	0.09	0.07	0.09	40.7
<b>East: Whiting Beach Road</b>												
4	L2	3	33.3	0.023	4.9	LOS A	0.1	0.8	0.05	0.38	0.05	32.2
5	T1	13	8.3	0.023	0.0	LOS A	0.1	0.8	0.05	0.38	0.05	41.8
6	R2	26	0.0	0.023	4.6	LOS A	0.1	0.8	0.05	0.38	0.05	45.1
Approach		42	5.0	0.023	3.2	NA	0.1	0.8	0.05	0.38	0.05	44.2
<b>North: Prince Albert Street</b>												
7	L2	107	1.0	0.090	4.6	LOS A	0.4	2.6	0.02	0.52	0.02	44.6
8	T1	7	0.0	0.090	4.2	LOS A	0.4	2.6	0.02	0.52	0.02	42.5
9	R2	19	0.0	0.090	4.8	LOS A	0.4	2.6	0.02	0.52	0.02	44.1
Approach		134	0.8	0.090	4.6	LOS A	0.4	2.6	0.02	0.52	0.02	44.5
<b>West: Whiting Beach Road</b>												
10	L2	5	0.0	0.006	4.6	LOS A	0.0	0.1	0.02	0.32	0.02	46.4
11	T1	4	0.0	0.006	0.0	LOS A	0.0	0.1	0.02	0.32	0.02	43.1
12	R2	1	0.0	0.006	4.6	LOS A	0.0	0.1	0.02	0.32	0.02	38.9
Approach		11	0.0	0.006	2.7	NA	0.0	0.1	0.02	0.32	0.02	45.3
All Vehicles		193	2.2	0.090	4.1	NA	0.4	2.6	0.03	0.47	0.03	44.4

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

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NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

