



Taronga Zoo Proposed African Savannah and Congo Exhibits Transport Impact Assessment

Client //	Taronga Conservation Society Australia
Office //	NSW
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Taronga Zoo

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Transport Impact Assessment

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GTA Consultants Office: NSW

Quality Record

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1. Introduction

1.1 Background

The “African Congo” project involves the renovation of an existing precinct 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).

GTA Consultants (GTA) was commissioned by Taronga Conservation Society Australia to undertake a transport impact assessment for the proposed development.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development 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 proposed development
- v The transport impact of the development proposal on the surrounding road network
- vi Construction traffic impact during the construction stages.

1.3 References

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

- o An inspection of the site and its surrounds
- o Mosman Municipal Council Transport Development Control Plan (DCP) 2005
- o Mosman Municipal Council Local Environmental Plan (LEP) 2012
- o Guide to Traffic Generating Development (Roads and Maritime Services (Roads and Maritime))
- o EIS Guidelines – Road and Related Facilities (Department of Planning and Environment (DoPE))
- o Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development
- o NSW Planning Guidelines for Walking and Cycling
- o NSW Long Term Master Plan 2012
- o Sydney's Cycling Future 2013
- o Sydney's Walking Future 2013
- o Other documents and data as referenced in this report.

2. Existing Conditions

Taronga Zoo is located at Bradleys Head Road, Mosman. The zoo encompasses a large area with the subject development located at the western side. The location of the subject site and its surrounding environs is shown in Figure 2.1. The site is zoned as SP1, Special Activities under the Mosman LEP 2012.

The site is bounded by Bradleys Head Road to the east, Athol Wharf Road and Sydney Harbour to the south, Little Sirius Cove to the west and Whiting Beach Road to the north.

Figure 2.1: Subject site and its environs



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2.1 Road Network

2.1.1 Adjoining Roads

Bradleys Head Road

Bradleys Head Road functions as a local collector road and is aligned in a north-south direction. At the entrance of the zoo, it is a two-way road configured with a three-lane, nine-metre wide carriageway, including a right turn lane allowing access into Taronga Zoo car parking.

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

Whiting Beach Road

Whiting Beach Road is a local road and in the vicinity of 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 park and site in general via the northern access.

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

2.2 Car Parking

A review of on-site parking for the Taronga Zoo indicated that a total of 846 parking spaces are provided (including overflow parking provision). Table 2.1 shows the breakdown of the location and type of parking spaces currently provided.

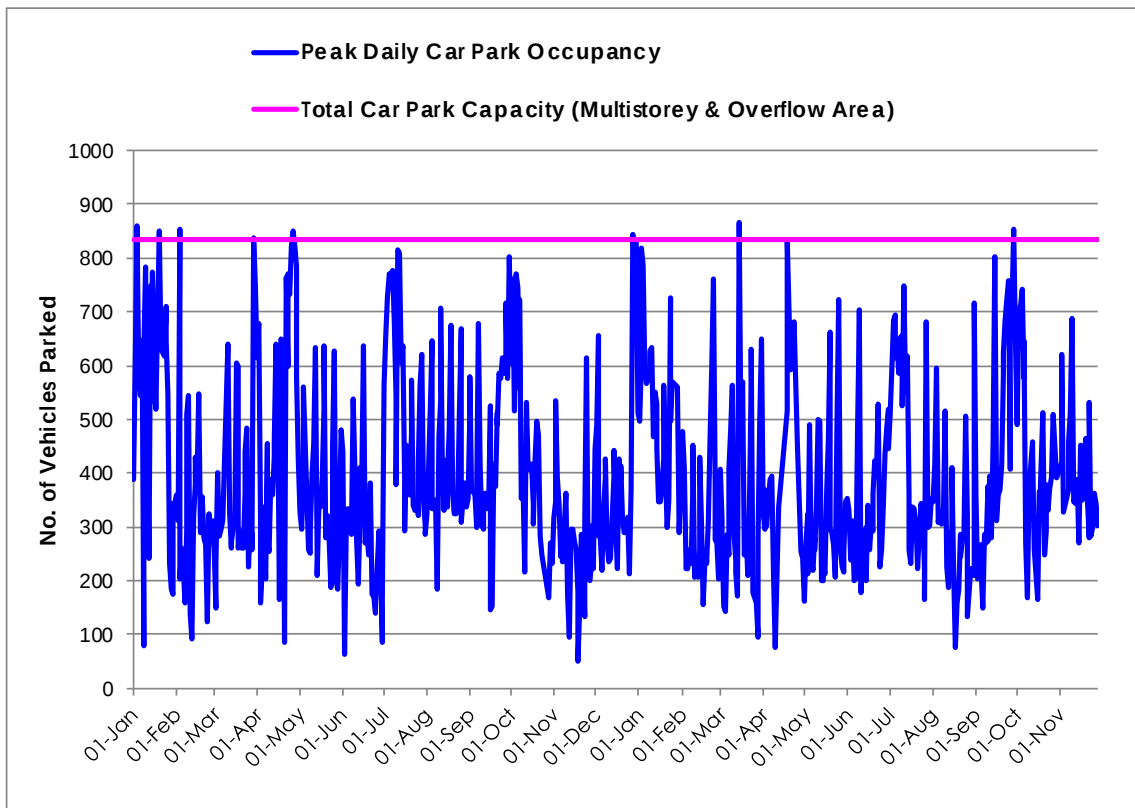
Table 2.1: Summary of on-site parking supply

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

It is noted that the overflow parking area is only made available once the multistorey parking area reaches its capacity. The total car park capacity including the multistorey car park and overflow area is 834 spaces, which does not include the 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.

Figure 2.2: Peak daily car park occupancy



In summary, the parking data results indicate the following:

- 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 85th 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.

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

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

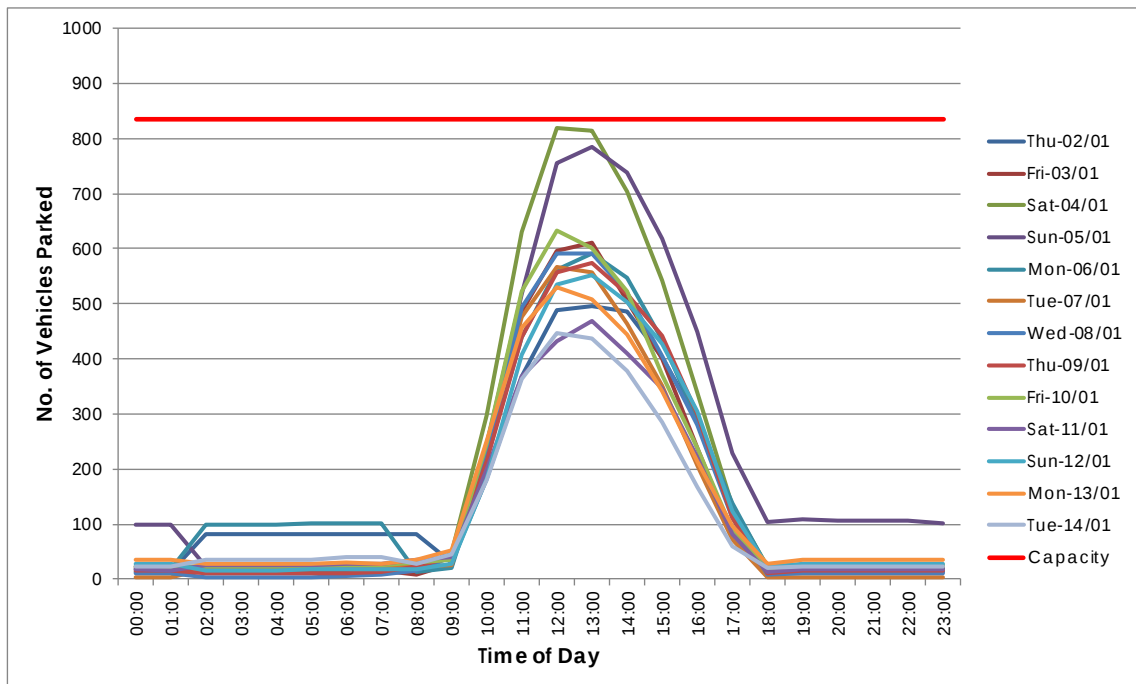


Figure 2.3 indicates that peak parking occupancy generally occurred between 12pm and 1pm and the parking occupancy decreases significantly after 2pm.

2.3 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.

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

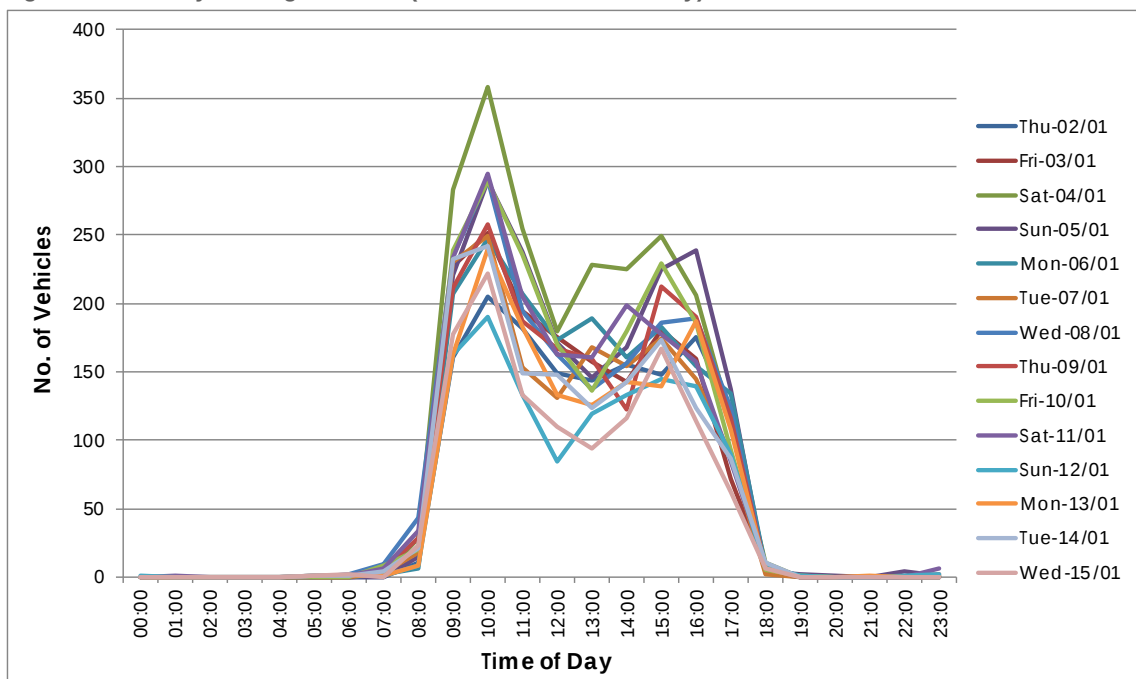


Figure 2.4 indicates the following:

- Weekday peak hour traffic generation of the zoo was 290 vehicles per hour, which occurred at 10am to 11am
- Weekend peak hour traffic generation was 358 vehicles per hour, which occurred at 10am to 11am
- The majority of vehicles entered the car park between 9am and 12pm
- Profile of vehicles exiting the car park was more spread out i.e. between 1pm and 6pm
- During the traffic network peak hour, the zoo generates in average of 20 vehicles (between 8am to 9am) and 100 vehicles (between 5pm to 6pm)
- Average daily traffic generation is approximately 1,550 and 1,910 vehicles during the weekdays and weekends, respectively.

2.4 Transport Plans and Studies

NSW Planning Guidelines for Walking and Cycling

The Planning Guidelines for Walking and Cycling provide guidance to land-use planners within local councils, consultancies and state agencies in ensuring walking and cycling improvements are taken into consideration in planning policy and practice. The guidelines provide a walking and cycling focus to the NSW Government's *Integrating Land Use and Transport Planning Policy Package*.

The guideline suggests that "when making planning instruments, councils are encouraged to integrate relevant state and local policies related to walking and cycling". This includes development policies in the DCPs and LEPs that encourage walking and/ or cycling that would be considered during the development assessment stage, thereby encourage improvements to walking and cycling facilities.

NSW Long Term Transport Master Plan 2012

The NSW Long Term Transport Master Plan 2012 (LTTMP) presents a 20-year vision for transport planning through to 2031. The LTTMP provides integrated advice with regards to transport policy; identifying solutions to develop and manage the NSW's transport system with short to long term strategies. Forming part of the LTTMP is Sydney's Rail Future, a long-term plan to increase the capacity of Sydney's rail network and update existing infrastructure.

Sydney's Cycling Future 2013

Sydney's Cycling Future was released in December 2013 following the release of the LTTMP to provide a mode specific cycling strategy. It presents a new direction for bicycle infrastructure planning in metropolitan Sydney by focusing on people who would like to ride more often if cycling was made a safer and more convenient option. It aims to make cycling a feasible transport option for these people by:

- Investing in separated cycleways and providing connected bicycle networks to major centres and transport interchanges
- Promoting better use of existing infrastructure
- Engaging with partners across government, councils, developers and bicycle users.

The strategy aims to prioritise investment on projects that have the greatest potential to get the most people to shift their short transport trips to bicycle. In order to achieve this, it aims to invest in connected routes within five kilometres of major centres and public transport interchanges.

The strategy outlines a “Connecting Centres Program” to assist councils to complete local bicycle networks to major centres in metropolitan Sydney.

Sydney's Walking Future 2013

Sydney's Walking Future was released in December 2013 following the release of the LTTP to provide a mode specific walking strategy for Sydney. The strategy recognises that walking is a fundamental component of an integrated transport system with most public transport trips starting and ending with walking.

The key aim of Sydney's Walking Future includes:

- Promoting walking for transport.
- Connecting people to places through safe walking networks around centres and public transport interchanges.
- Engaging with partners across government, councils, non-government organisations and the private sector.

The strategy seeks to create a culture of walking for transport by promoting walking as a viable and attractive transport choice, particularly for travelling to and from work and school. The strategy aims to focus infrastructure investment on completing connections within two kilometres of centres and public transport interchanges. In addition to this, the strategy aims to link walking to urban growth and to prioritise the needs of pedestrians in the planning, design and construction of new transport and urban development projects.

2.5 Public Transport

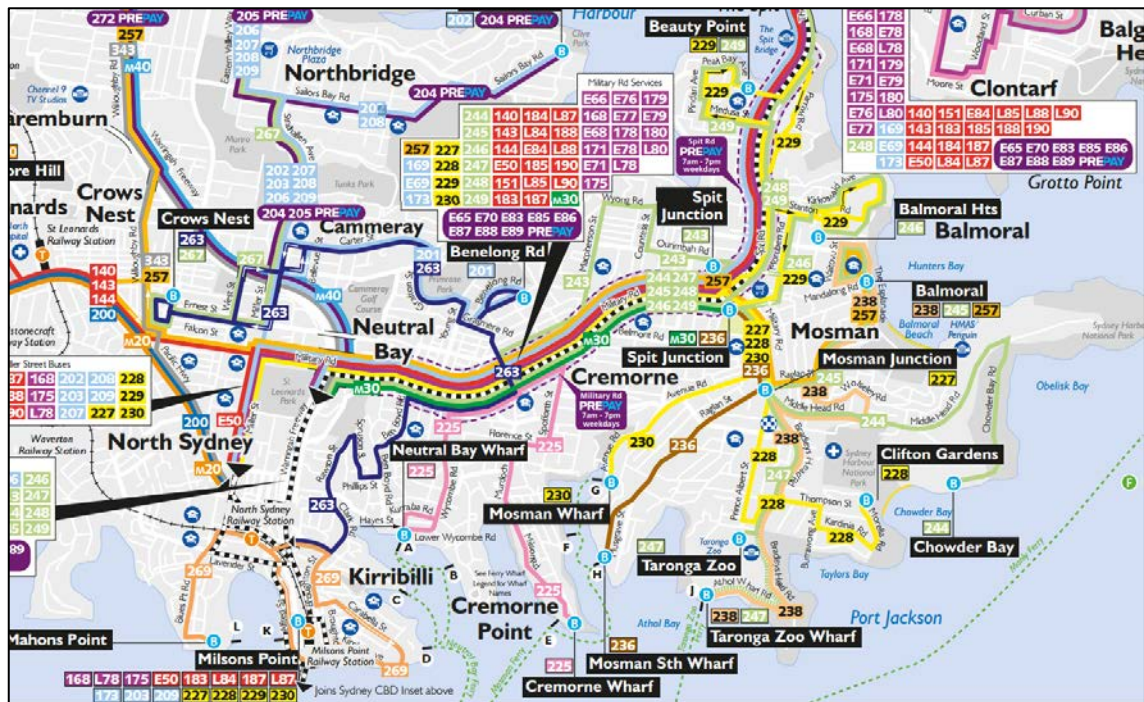
The site is accessible by public transport via bus or ferry. Bus stops are located at the main entrance off Bradleys Head Road and ferry wharf is located at southern entrance of the zoo.

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	247	City to Taronga Zoo	Taronga Zoo	on site	30 minutes peak and off peak
Bus	238	Balmoral Beach to Taronga Zoo	Taronga Zoo	on site	30 minutes peak and off peak
Bus	228	Milsons Point to Clifton Gardens	Bradleys Head Road	100 m	50 minutes peak/ and 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/region-guide-sydney-lower-north-shore.pdf>, accessed 11/07/17

2.6 Pedestrian and Cycle Infrastructure

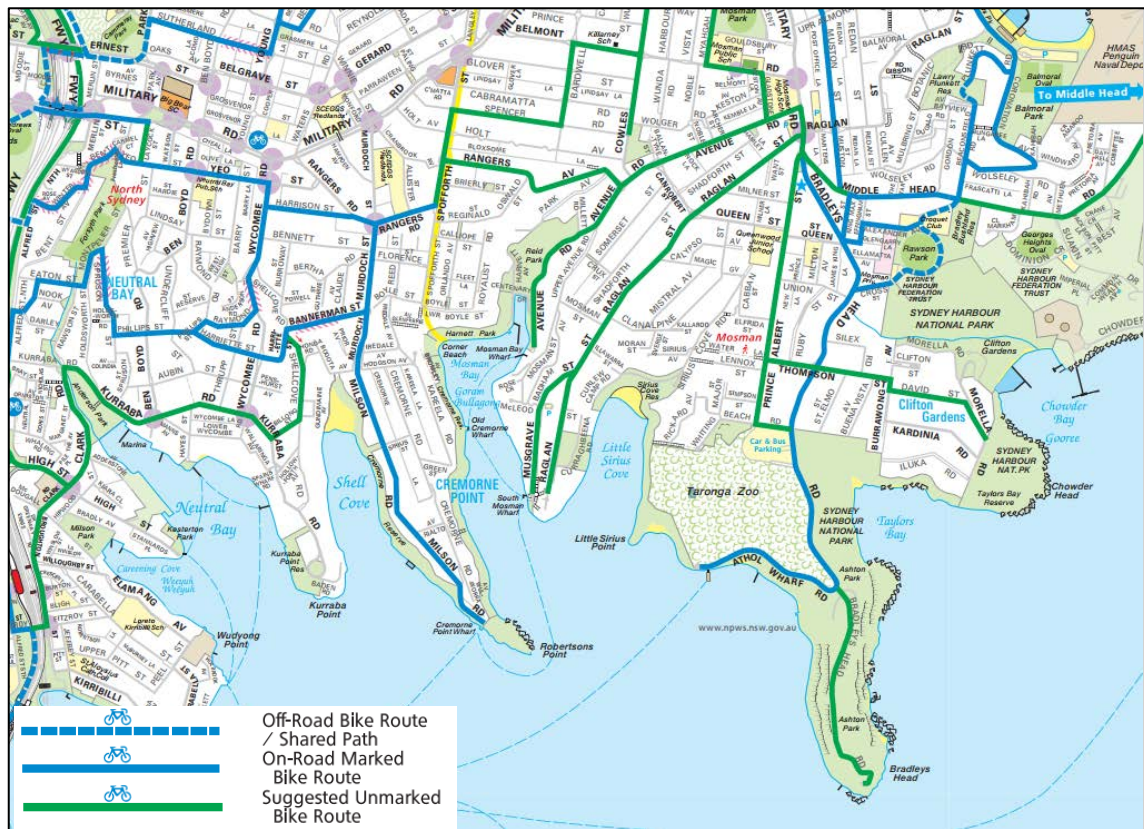
Formal pedestrian footpaths are provided at the following locations:

- 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: http://www.mosman.nsw.gov.au/file_download/1945/NorthernSydneyCyclingMap.pdf, accessed 11/07/17

2.7 Travel Modes from/ to Taronga Zoo

On the basis of the above, the site is 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 via ferry or bus, with the remaining 40 per cent using private vehicles.

3. Development Proposal

The project involves the redevelopment and expansion of the existing African Savannah precinct, to consolidate existing exhibits of African wildlife into two precincts, to be known as the “African Savannah” and “Congo” Exhibits. The development will include:

- Demolition of existing exhibits and infrastructure.
- Construction of new, expanded exhibition space known as African Savannah with:
 - A combined Giraffe and Zebra exhibit
 - Lion exhibit
 - Meerkat and Fennec Fox exhibit.
- Construction of new, expanded exhibition space known as Congo with:
 - Two Gorilla exhibits.
 - Lowlands rain forest.
 - Okapi exhibit.

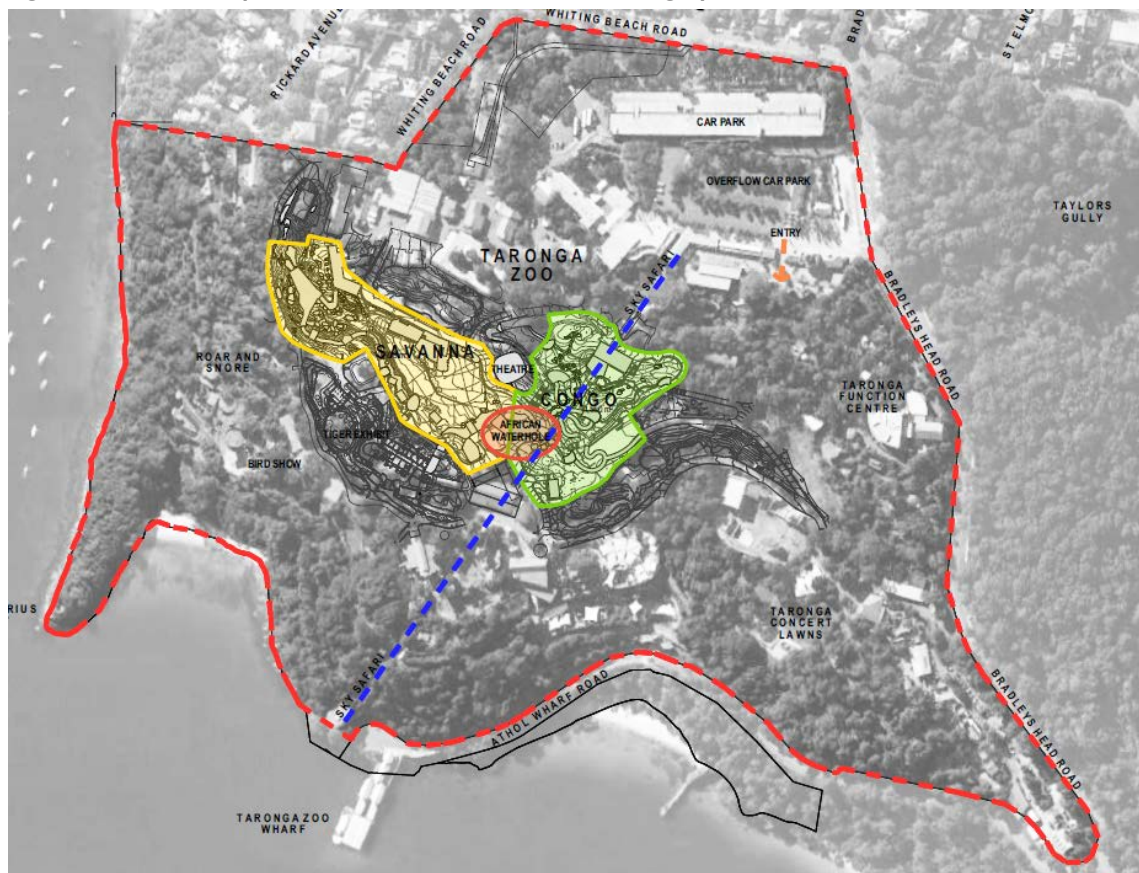
While the redevelopment includes an expansion of the site area, the development will not include an increase in the use of the site, as the redevelopment only involves a rearrangement of existing exhibits and precincts.

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

It is proposed that all deliveries to and from the new exhibit will be provided via Whiting Beach Road access through the security portal, as is the arrangement for the adjacent precinct, the *Sumatran Tiger Adventure*.

Figure 3.1 shows the location plan of the proposed African Savannah and Congo precinct.

Figure 3.1: Location plan of the African Savannah and Congo precinct



Source: Taronga Zoo, May 2017

4. Car Parking

4.1 Car Parking Requirements

Mosman Municipal Council's Transport Development Control Plan 2005 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 a consolidation.

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

4.2 Taronga Zoo On-Site Car Park

As presented in Section 2.2, Taronga Zoo currently provides in total of 834 car parking and 12 motorcycle spaces in its multistorey and overflow parking area. The peak daily parking occupancy profile is presented in Figure 2.2. The results of the parking analysis indicate that the 85th 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 5.6 days over a one year period.

4.3 Adequacy of Parking Supply

The results of the parking analysis indicated that the 85th percentile peak parking occupancy was 618 spaces, with minimum of 216 available car parking spaces. Therefore, the existing multistorey car park would have some capacity to accommodate a temporary increase in parking demand during the opening period.

As discussed, it is acknowledged that during the initial weeks following the opening of the new exhibit, that there would be some increase in additional parking demand. 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 85th percentile demand of 618 spaces equates to an additional parking demand of approximately 62 spaces. Based on the availability of 216 spaces, this temporary surge can be easily accommodated within the existing multistorey car park.

The proposed African Savannah and Congo precincts are not expected to generate any increase in parking demand over the long term. This is due to the fact that the majority of the animals that will inhabit the proposed precincts are already present in the zoo's existing exhibits. As such, the effect of any 'new' appeal is anticipated to be low, with the proposed Sumatran Tiger Adventure facility to be operating for approximately 18 months prior to the completion of Savannah.

GTA's Transport Impact Assessment for the Australia Habitat and Taronga Wildlife Retreat¹ 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.

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

The anticipated guest arrival would typically occur 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 the additional demand arising from the retreat. That said, it is conservatively assessed that 50% of the parking demand will occur during the peak parking occupancy period, equivalent to 31 spaces.

Considering the proposed African Savannah and Congo precincts temporary surge in demand in combination with the proposed retreat, the additional total parking demand could equate to 93 spaces. This would be able to be accommodated within the 85th percentile spare capacity of 216 spaces.

It is worth noting that the 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 new 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.

Noting the above, it is believed that the current parking supply at the Zoo is considered more than sufficient to accommodate any increase in demand that the Zoo may experience due to the opening of the proposed development. Following the first few weeks of opening, visitation numbers are expected to settle and largely remain as per existing and hence, additional parking is not required.

5. Traffic Impact Assessment

Similar to parking demand, the proposed African Savannah and Congo Exhibits is not expected to generate additional traffic to Taronga Zoo. This is because, visitors and members generally visit the centre to experience the overall zoo and not just the African Savannah and Congo.

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

Based on the data obtained from the existing multistorey car park usage during the first two weeks in January 2014 (i.e. busiest period of the year), the average daily traffic generation of the zoo is approximately 1,550 and 1,910 vehicles during the weekdays and weekends, respectively. Therefore, the temporary increase in daily traffic flows during the opening periods is expected to be up to about 160 to 190 additional vehicles per day.

5.1 Zoo's Weekday and Weekend Peaks

The average peak hour traffic generation of the zoo is 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.

Based on GTA's Transport Impact Assessment², 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.

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 peak hour. This equates to less than one additional vehicle per minute.

5.2 Morning and Afternoon Commuter Peak

The average traffic generated by the zoo during the road network peak period is 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.

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

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

5.3 Summary

It is expected that the local traffic conditions in vicinity of the site would not be adversely affected by this proposal and as such it is not anticipated that mitigation measure is necessary.

6. Construction Traffic Impacts

6.1 Proposed Works

The two exhibits, “African Savannah” and “Congo” are to be undertaken at two stages. The proposed works can generally be summarised as follows for each of the two exhibits:

- Stage 1 – Demolition of the existing exhibits
- Stage 2 – Excavation of the proposed expansion
- Stage 3 – Construction of new exhibition space.

6.2 Work Hours

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

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

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 DoPE.

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 would use the following accesses:

- Whiting Beach Road access via the staff car park (to be used during work hours)
- Bradleys Head Road access (to be used outside of zoo operating hours).

Figure 6.1 presents the access points and routes for construction vehicles within the zoo grounds.

[illegible]

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 km/h.
3. Do not drive vehicles including suppliers' delivery vehicles within the public areas of the zoo between the hours of 9am to 5pm during school holidays and weekends, and 10am to 3pm at other times.
4. Between 6am and 9am and between 5pm and 6pm during school holidays and between 6am and 10am and between 3pm and 6pm 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 6am to 6pm 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 1pm 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 would occur outside of the busy zoo operating period. Vehicle access within the zoo grounds would generally be limited to 6am to 10am and 3pm to 6pm.

6.5 Construction Vehicle Routes

The designated truck routes for construction vehicles are:

- To/ from north – via Spit Road/ Military Road/ Bradleys Head Road
- To/ from west – via Military Road/ Bradleys Head Road.

The construction vehicles would access the site via Whiting Beach Road during work hours and would be permitted to access the site via the Bradleys Head Road access outside of zoo operating hours.

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.

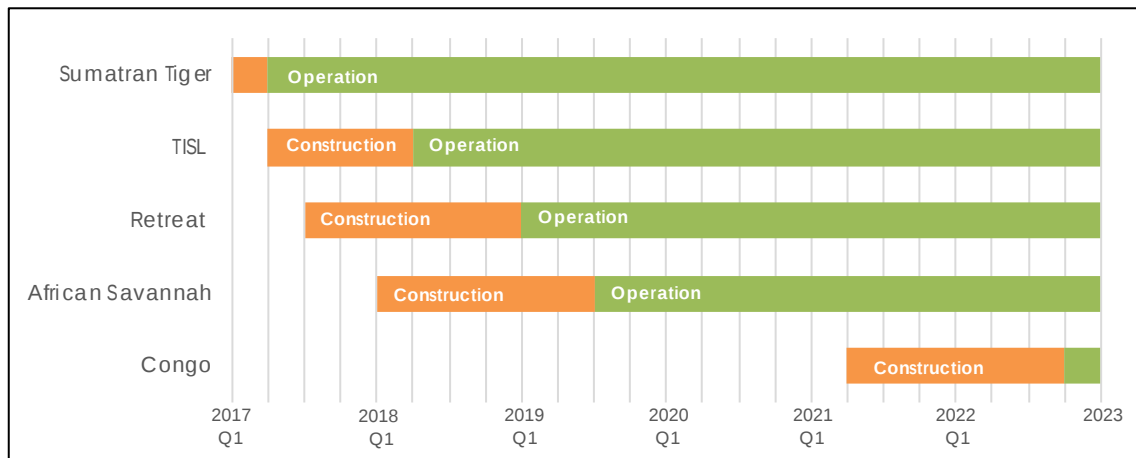
Figure 6.2: Construction vehicle access routes



6.6 Expected Cumulative Traffic and Parking Demands

The cumulative construction traffic and parking impacts associated with the ongoing and planned projects are assessed based on their respective construction and operational timelines. Details of the envisaged timelines and construction traffic volumes have been provided by the Zoo and are summarised in Figure 6.3.

Figure 6.3: Project timeline



Source: Taronga Zoo

Note: TISL = Taronga Institute of Science and Learning

The zoo's peak operating periods on Saturdays are between 11am and 3pm. Concurrently, it is understood that construction activities are typically carried out from 7am to 1pm on Saturdays with peak vehicle movements generally occurring an hour before construction activities start at 7am as well as an hour after construction activities ends at 1pm, as workers enter and leave the site. As such, this assessment considers the overlap between the zoo's peak operation and the Saturday construction peak periods, i.e. between 1pm and 2pm.

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.

Existing Traffic and Parking Circumstance

The analysis detailed in Section 2 reported a surveyed traffic generation of 358 vehicles per hour (vph) during the weekend peak, which is 10am to 11am. Corresponding to this period, the carpark occupancy survey revealed an 85th percentile spare capacity of 216 available car parking spaces. Consider the peak construction traffic is envisaged to occur within the hour after construction activities end at 1pm, it is noted that both the peak visitation and construction traffic would not coincide.

Anticipated Traffic and Parking Demand

On this basis, the Saturday peak traffic generation and parking demands of both the ongoing and planned projects are indicated in Table 6.1. The following only indicates peak site traffic generation (between 1pm and 2pm) when workers leave the site at the end of the work day. It should be noted that outside this period, traffic generation will only include construction vehicles, which would equate to up to two vehicles per hour.

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

Project		Construction		Operation	
		Workers (Cars) ^[1]	Trucks	Staff ^[2]	Visitor
African Savannah	Traffic	Up to +6 vph	Up to +2 vph	No additional staff or parking demand	Up to +35 vph and up to 35 parking spaces required for the initial weeks of opening only, before returning to existing demand
	Parking	Up to 12 required	No parking demand		
Congo	Traffic	Up to +6 vph	Up to +2 vph		
	Parking	Up to 12 required	No parking demand		
Sumatran Tiger	Traffic	Up to +5 vph	Up to +2 vph	No additional staff	Up to +30 vph
	Parking	Up to 12 required	No parking demand	No parking demand	Up to 30 required
TISL	Traffic	Up to +25 vph	Up to +2 vph	Up to +5 vph	Up to +2 vph ^[3]
	Parking	Up to 25 required	No parking demand	Up to 5 more occupied	Not applicable (coach parking)
Retreat ^[5]	Traffic	Up to +25 vph	Up to +2 vph	Guest arrivals usually occur between 3:30pm and 5:30pm with typical departures between 10:00am and 11:00am, therefore minimal overlap/ impact.	
	Parking	Up to 25 required	No parking demand	Up to 9 parking spaces, and accommodated within the staff carpark	Up to 62 parking spaces. Parking demand occur outside of peak period (1pm-2pm), therefore minimal overlap/ impact.

[1] Construction workers are assumed with a vehicle occupancy rate of 2:1

[2] Staff volumes are included in 'Visitor' volumes for the African Savannah, Congo, Sumatran Tiger and Retreat projects

[3] TISL (Taronga Institute of Science and Learning) is only opened for school students and only comprised of arrivals/departures by coaches

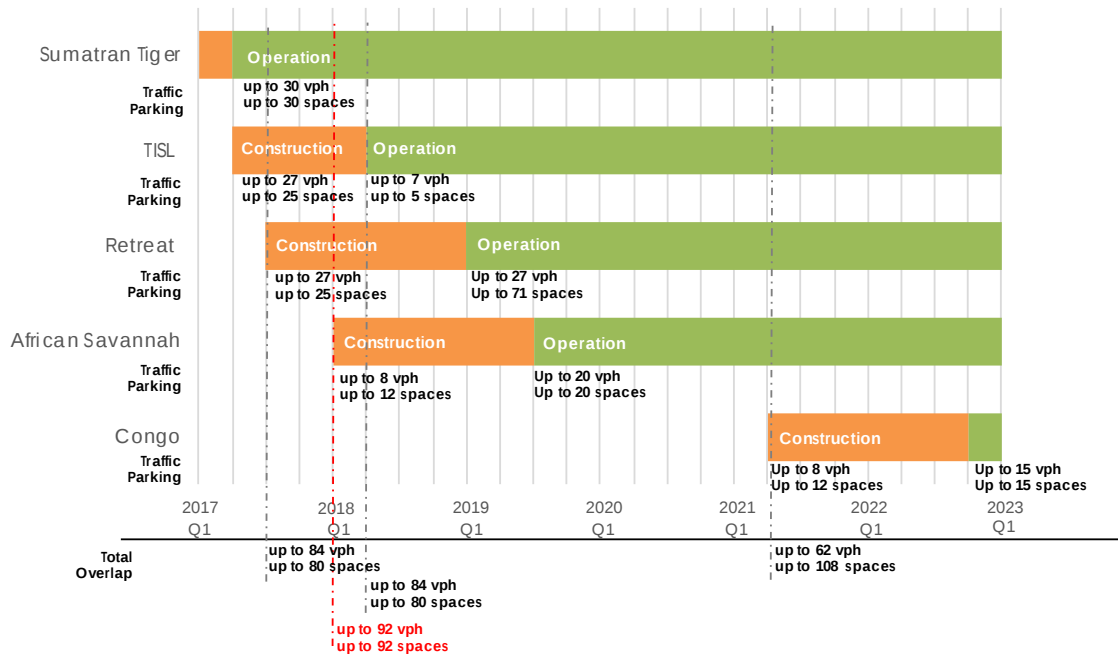
[4] Construction traffic volumes have been estimated by the Zoo based on observations of existing condition

[5] Taronga Zoo – Proposed Australia Habitat & Taronga Wildlife Retreat – Transport Impact Assessment, GTA Consultants, dated 07 March 2016

Traffic Impact

The above traffic and parking demands are considered in the context of the overlap of construction and operational timelines in Figure 6.4.

Figure 6.4: Critical overlap of traffic and parking demand



The peak overlapping traffic and parking demands are expected to occur in quarter 2 of 2018 and the demand is envisaged to reduce from quarter 3 of 2018 when the construction of TISL is completed. Further reduction is envisaged from quarter 1 of 2019 when the construction of Retreat is completed which will leave only the minimal construction traffic to be generated by African Savannah project.

It is noted that not all the workers would 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 10am and 11am, which hence does not coincide with the peak construction traffic, which normally occurs between 1pm and 2pm. Furthermore, with a notable section of the site under construction, visitor traffic to the site would likely be lower than is typical. Nonetheless, Figure 2.4 indicates that the peak site traffic generation from 1pm to 2pm with up to 230 vehicles per hour. On this basis, it can be estimated that the peak Saturday operation will generate peak traffic flows of 322 vph (i.e. existing 230 vph plus 92 vph cumulative traffic).

This estimated traffic generation is notably lower than the peak traffic generation to the Taronga Zoo site from general operations, with Figure 2.4 indicating a generation of up to 388 vph. In this regard, the Taronga Zoo site and adjacent roads are expected to can accommodate the peak, cumulative construction traffic from the site of 92 vph.

Parking Impact

The extensive parking survey revealed an 85th percentile spare capacity of 216 spaces across 22 months and taking seasonal effects into consideration. The anticipated peak overlapping parking demand during construction, which sums to a total of 92 spaces, will be comfortably accommodated within the 85th percentile car parking capacity.

Construction workers' parking demand is comprised of 62 spaces during the busiest overlapping period. These periods correspond to the beginning of the African Savannah works. While around 12 of the 92 parking spaces are associated with this project, generally the commencement of works involves much lesser workers on site concurrently as the site is being prepared for full scale construction. On this basis, the envisaged overlapping parking demand will be somewhat conservative.

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

- 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 the two access points, which are via Bradleys Head Road or Beach Road.

In addition, access to neighbouring sites by emergency vehicles should not be affected by the works as the road and footpath in vicinity of the site would be unaffected.

7. Other Transport Implications

7.1 Pedestrian and Cyclist Implications

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

The impact of the vehicular traffic arising from the development in the vicinity of the site would have minimal impact on existing walking and cycling facilities on the surrounding road network.

7.2 Public Transport Implications

Similarly, the proposed development 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.

8. Conclusion

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

- i The proposed development does not involve additional facilities and therefore will not generate any additional parking demand.
- ii As additional parking is not required, none will be provided on site.
- iii However, it is acknowledged that there would be some increase in additional parking demand during the first few weeks following the opening of the new exhibit the results of the parking analysis indicated that the 85th percentile peak parking occupancy was 618 spaces, being equivalent to a minimum of 216 available car parking spaces.
- iv 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 guests of the Australia Habitat & Taronga Wildlife Retreat.
- v It is proposed that all deliveries to and from the new exhibit will be provided via Whiting Beach Road access through the security portal.
- vi During the first few weeks following the opening of the new exhibit, increase in peak hour traffic flows is expected to be up to 30 vehicles per hour.
- vii 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.
- viii It is anticipated that the existing road network could absorb this minor increase without any such traffic related implications.
- ix It is estimated that the construction stage would generate some 20 construction vehicle deliveries per day (i.e. up to two vehicles per hour). At this frequency, it is unlikely that the surrounding road capacity is adversely impacted.
- x Cumulative traffic generation from proposed exhibits on-site is expected to be up to 92 vph during the peak period. The site and surrounding roads can be expected to accommodate the increase in traffic generation as historical site traffic data indicates the site has previously reached equivalent or higher volumes.
- xi The additional visitors expected to be generated by the opening of the exhibit could be accommodated on the existing public transport network.

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