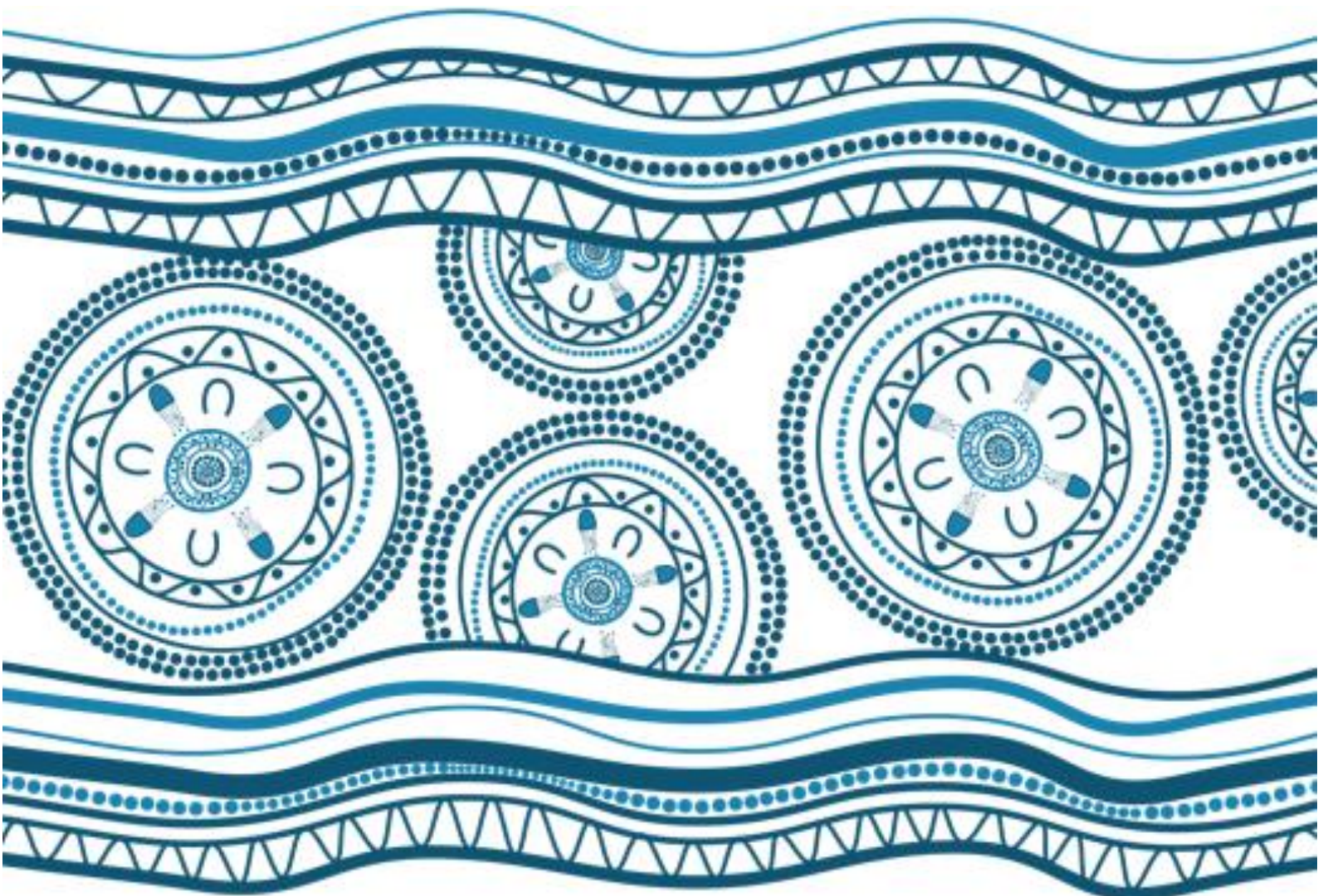


Chapter 12

Traffic and transport



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12 Traffic and transport

This chapter presents an assessment of the impacts of the project on land and marine traffic and transport and identifies mitigation and management measures to minimise and reduce these impacts.

The assessment presented in this chapter draws on information from Appendix K (Landside Traffic and Transport Assessment Report) and Appendix L (Navigational Safety Assessment).

12.1 Assessment methodology

12.1.1 Landside traffic and transport assessment

The method for the landside traffic and transport assessment involved:

- Reviewing the existing transport infrastructure and strategic context, including master plans, transport strategies, bicycle plans and proposed upgrade plans
- Estimating construction and operational vehicle trips, type and frequency
- Modelling the impacts from the project on the local road network
- Assessing the impacts from construction related traffic, haulage along construction access routes and construction worker parking
- Assessing the impacts from the operation of the project on the road network, parking, public transport, pedestrians/cyclists and access
- Recommending mitigation measures to manage traffic and transport impacts.

12.1.2 Marine traffic and transport assessment

The method for assessing marine traffic and transport impacts involved:

- Identifying the existing maritime traffic environment in Botany Bay, including users and the type/frequency of vessel movements
- Consulting with relevant groups to determine the existing maritime and marine uses within Botany Bay and how they may be impacted
- Assessing the likelihood, consequence and overall risk for maritime hazards
- Recommending mitigation measures to avoid and reduce any identified impacts.

12.1.3 Policy framework

The transport assessment considered the following guidelines and documents. The guidelines listed in the SEARs were not relevant for this assessment.

Landside

- *Disability Discrimination Act 1992* (Cth) (DDA)
- Randwick Bicycle Route Construction Priority Map (Randwick City Council, 2015)
- Future Transport 2056 (Transport for NSW, 2018a)
- South East Sydney Transport Strategy (Transport for NSW, 2020f)
- Sutherland Shire Bicycle Network Map (Sutherland Shire Council, 2015)
- Kamay Botany Bay National Park Kurnell Master Plan (NSW DPIE, 2019).

Marine

- Navigating the Future – NSW Ports' 30 Year Master Plan (NSW Ports, 2015)
- Port Authority of NSW Annual Report 2018/19 (Port Authority of NSW, 2019)
- Information for Recreational Boaters – Botany Bay Vessel Movements (Port Authority of NSW, 2020)
- Harbour Master's Directions Sydney Harbour & Botany Bay (Port Authority of NSW, 2016).

12.2 Existing environment

12.2.1 Landside traffic and transport environment

This section outlines the existing road network, parking, public transport and active transport provisions at La Perouse and Kurnell.

The existing traffic and transport features are shown in Figure 12-1 and Figure 12-2.

The information about the existing transport environment is informed by historical data including tube count data, crash data and public transport data (via opal usage). In addition, surveys were carried out in February and August 2020, which included:

- Vehicle, pedestrian and cyclist counts at key intersections
- Parking surveys, including duration and licence plate recognition surveys at La Perouse and occupancy surveys at Kurnell
- Pedestrian counts along Monument Track, Kurnell.

Road network and intersections

Traffic performance is typically qualified in terms of Level of Service (LoS) and Degree of Saturation (DoS). LoS measures how well the intersection services the volumes of traffic that use it. The worse the LoS the greater the traffic delay because there is a higher DoS. LoS is measured from A (very good) to F (highly congested) while DoS is measured relative to an acceptable level of 1.0. A LoS below C and a DoS above 1.0 means there is likely to be some traffic delays.

Given that there is only ever up to around 950 vehicle movements in La Perouse per hour and around 370 in Kurnell, the intersections have sufficient capacity to accommodate current traffic demand. However, results at La Perouse indicate that car parking causes notable traffic queues extending through the Anzac Parade loop. The existing LoS and DoS for key intersections are shown in Table 12-1. For more detailed intersection modelling results refer to Appendix K (Landside Traffic and Transport Assessment Report).

Table 12-1: Weekday and weekend intersection modelling results

Intersection	Weekday intersection modelling results		Weekend intersection modelling results	
	LoS	DoS	LoS	DoS
La Perouse				
Endeavour Avenue/Anzac Parade	A	0.22	A	0.29
Anzac Parade loop	A	0.31	A	0.42
Kurnell				
Captain Cook Drive/Cape Solander Drive	A	0.07	A	0.09
Captain Cook Drive/Polo Street	A	0.07	A	0.09

Road Safety

Crash data between October 2014 and September 2019 were obtained from Transport for NSW. A total of five non-fatal crashes were recorded at La Perouse over the five-year period. Two crashes related to parking manoeuvring, two involved cyclists and one involved a motorcyclist. No fatal crashes were recorded.

At Kurnell, three non-fatal crashes were recorded between 2014 and 2019. Two crashes related to parking manoeuvring and all involved either a cyclist or motorcyclist. No fatal crashes were recorded.

Parking

Parking surveys were conducted in summer on Sunday, 2 February 2020 at La Perouse and Kurnell. This day was chosen to represent a typical busy day during the summer months. Social

distancing restrictions were in place due to Covid-19 and may have affected the number of visitors at both locations.

The parking surveys at La Perouse showed:

- There are no timed parking restrictions during the day along Anzac Parade. Parking is restricted at night time between 10pm and 3am.
- The busiest times for car parking is predicted to occur on the weekend, with higher numbers of vehicles entering and exiting the project area between 11am and 3pm.
- The high turnover of vehicles caused congestion on Anzac Parade which is a one-way loop system. Vehicles had to stop along Anzac Parade to wait for parking spaces, which resulted in further congestion.
- Most (70 per cent) cars were short-term visitors, staying between 30 minutes and one hour (62 per cent). The remaining eight per cent stayed less than 30 minutes. This is likely because vehicles were dropping off passengers or unable to find parking, which indicates there is likely suppressed parking demand.

The parking surveys at Kurnell showed that:

- There are no parking restrictions along Captain Cook Drive. Along Prince Charles Parade there is unrestricted 90 degree car parking. Further south along Prince Charles Parade, on-street parallel parking is restricted between 6am and 6pm on weekends and public holidays. Vehicle access to the Kamay Botany Bay National Park (the National Park) is from 7am to 7.30pm from Cape Solander Drive. Paid parking applies in the National Park.
- The busiest time for car parking is predicted to occur on the weekend, with the highest occupancy recorded at 1pm (91 per cent), which reduced to 78 per cent by 2pm. While this suggests the highest parking demand at Kurnell is over a lunch time on weekends, there is sufficient space to accommodate this demand.

Public transport

Bus services are the only form of public transport provided at both La Perouse and Kurnell. At La Perouse, all buses (except school routes) run every 15 minutes on weekdays and weekends. At Kurnell, the service runs every hour on weekdays and every 1 to 2 hours on weekends (Saturday only). Bus route information is presented in Table 12-2.

Table 12-2: Bus routes

Bus route number	Bus route
La Perouse	
391	Central Station and La Perouse
393	Central Station and La Perouse
394	Circular Quay and La Perouse
L94	Circular Quay and La Perouse
X94	Museum Station and La Perouse
614E	La Perouse and Sydney Girls High School
658E	La Perouse and Our Lady of the Sacred Heart (OLSH) College Kensington
736E	La Perouse and South Sydney High School
Kurnell	
987	Kurnell and Cronulla

The nearest bus stop to the proposed wharf at La Perouse is located outside 1597 Anzac Parade (Stop ID: 203622), 300 metres to the east of the proposed wharf.

The nearest bus stop at Kurnell is located opposite 1-5 Captain Cook Drive (Stop ID: 223134), 350 metres to the south of the proposed wharf.

Pedestrian footpaths

La Perouse

At La Perouse, footpaths are provided around the full outer perimeter of the Anzac Parade loop, connecting to the retail frontage at Anzac Parade and along the eastern and western sides of Endeavour Avenue. There are walking trails nearby. These include Congwong Trail off Henry Head Lane, connecting to Congwong Beach and Little Congwong Beach. The Anzac Parade loop has pedestrian access to a Bare Island Bridge, which is a popular tourist location. The bridge connects to Bare Island to the south.

Given the tourist attraction of the area and the pedestrian infrastructure, walking activity is high especially between landmarks and retail areas. The data from the intersection surveys conducted show that while the area facilitates walking locally, it does not represent walking as a method of travel to La Perouse.

Kurnell

At Kurnell, footpaths are provided along the northern and southern sections of Prince Charles Parade, along the southern end of Captain Cook Drive between Prince Charles Parade and Polo Street. The footpaths also extend along the northern side of Princes Charles Parade between Polo Street and Torres Street. The northern footpath along Princes Charles Parade connects onto Monument Track in the National Park. Monument Track connects to the Visitor Centre in the National Park, and to other walking trails including Muru Trail, Yena Trail and Cape Bailey Track.

Cycling

La Perouse

Cycling infrastructure at La Perouse consists of a shared path along Anzac Parade from the intersection of Goorawahl Avenue, connecting to Military Road at Chifley. La Perouse is part of a popular cycling route. Sydney Cycling Club holds a 41 kilometre route between Bondi Beach and La Perouse every Saturday morning, and a 27 kilometre loop every Thursday morning.

Kurnell

Captain Cook Drive in Kurnell forms a popular road cycle route with people cycling through the National Park to the Cape Solander Whale Observation Platform.

Sutherland Shire Council recently completed the Silver Beach Promenade which is a 1.5 kilometre shared path that connects from Bonna Point Reserve to the National Park.

Modes of transport

Analysis of the transport modes used across the project is useful to understand the existing transport environment of the area. The results show that due to limited access to public transport, there is a heavy reliance on private vehicles and low usage of public transport and cycling. For more detailed information of modes of transport used by the population at La Perouse and Kurnell, refer to Appendix K (Landside Traffic and Transport Assessment Report).



Figure 12-1: Existing transport environment at La Perouse



Figure 12-2: Existing transport environment at Kurnell

12.2.2 Marine transport environment

Botany Bay is used by a variety of shipping, commercial and recreational vessels.

Shipping operations

Botany Bay is home to Port Botany, which is one of Australia's largest container ports. It specialises in trade of container manufactured products and bulk liquid imports. Port Botany is located about two kilometres northwest of the La Perouse headland.

The Kurnell Port and Berthing Facility is located about 300 metres to the southwest of the proposed Kurnell wharf. The port receives and stores refined oil products such as petrol, diesel and aviation fuel.

In 2019, there was 1660 seagoing ship visits in Botany Bay. This equates to an average of nine vessel movements per day to or from Port Botany or the Kurnell Terminal Wharf. Seagoing ships over 30 metres visiting Botany Bay are escorted by a Port Authority pilot vessel and tugboats if the conditions require. Other vessels are required to remain at least a 30-metre distance from the ship and not pass between the ship and escort vessels.

It is forecast that total vessel numbers associated with Port Botany are expected to grow by 45 per cent over the next 30 years (NSW Ports, 2015).

Port Botany is serviced by a deep-water shipping channel as shown in Figure 12-3.



Figure 12-3: Shipping channel in Botany Bay

Commercial boating activities

The following commercial and charter vessels are known to operate in Botany Bay:

- About six 'hire and drive' vessel operators (predominantly around Georges River)
- Two fishing charter boat operators
- Georges River Cruises.

The Boating Industry Association advised that about 80 per cent of the commercial and recreational boating activities in Botany Bay are located away from the project area.

Recreational boating activities

Botany Bay is used by a variety of recreational boat users. Some of these recreational users include:

- Rowing, sailing and boat racing activities associated with Botany Bay Yacht Club, Georges River Sailing Club, Yarra Bay Sailing Club, Kurnell Catamaran Club, St George Sailing Club, St George Motor Boat Club
- Recreational based fishing
- Kite surfers – typically on the southside of Botany Bay
- Personal watercraft users (such as jet skis)
- Diving and snorkelling activities
- Vessel moorings in Yarra Bay are used by Club members, or on a first come first served basis
- Other recreational events include swimming races and triathlon which predominantly take place on the west side of Botany Bay.

Swing moorings

There are 10 club moorings, one private, two courtesy public and one emergency public moorings at La Perouse and 12 club moorings, one private and one courtesy public mooring at Kurnell. These are shown on Figure 12-4 and Figure 12-5.



Figure 12-4: Existing mooring locations at La Perouse



Figure 12-5: Existing mooring locations at Kurnell

12.3 Assessment of potential impacts

The following summarises the traffic impact assessment presented in Appendix K (Landside Traffic and Transport Assessment Report) and marine traffic impacts presented in Appendix L (Navigational Safety Assessment).

12.3.1 Assessment of land construction impacts

Construction traffic

Over the 13-month construction period, it is expected that about 20 vehicles would arrive and leave La Perouse and 20 vehicles would arrive and leave Kurnell every day, increasing to 50 vehicles during the site establishment period. Around 25 people would be working at each site per day during construction, which would increase to around 40 people during the main construction stage.

Construction is set to mainly take place during standard working hours which are:

- Monday to Friday 7am to 6pm
- Saturday 8am to 1pm
- No work on Sundays or public holidays.

Expected haulage routes would be via Anzac Parade, La Perouse, and Captain Cook Drive, Kurnell (refer to Figure 5-19 and Figure 5-20). Heavy vehicles would arrive and leave the site at regular intervals throughout the day. This means there would be no more than two heavy vehicles arriving and leaving each of the construction areas each hour. Construction workers would arrive at the construction sites typically before 7am and leave after 6pm.

The volume of traffic expected from construction vehicles and construction workers could be easily supported on the existing road network without creating delay or impacting on existing network performance. The existing LoS and DoS ratings indicate that existing intersections have significant capacity to accommodate the limited construction traffic anticipated.

For the majority of construction, temporary road diversions are not expected. Utilities installation and car parking reconfiguration may require diversion along the Anzac Avenue loop at La Perouse and along Captain Cook Drive, Kurnell. It is likely that the construction could be staged so that the roads are reduced to one-lane traffic, rather than closed completely, therefore not restricting access for other road users.

The delivery and collection of large construction equipment such as cranes or piling rigs would be carried out with specific traffic management to avoid impacts on the road network and inconvenience to road users.

Parking

For the majority of the construction period, there would be no direct impacts on existing parking areas at La Perouse and Kurnell as the construction and construction compound areas are located outside of the road corridor. There would be temporary impacts to car parking areas where the proposed car parks are to be reconfigured at La Perouse. This would be for a duration of about two months. The reconfiguration of car parking would impact 20 bays at La Perouse (around six per cent of total parking in Anzac Parade loop).

Construction workers would arrive to site by construction vehicles, private vehicles, public transport and shared vehicles. The majority of construction worker vehicles would be able to park within the nominated construction compounds. It would be the responsibility of the contractor to ensure that where this is not achievable, alternative arrangements are made for construction worker transport.

Public transport

Construction at both La Perouse and Kurnell will not cause any impacts to public transport or existing bus services. As a result, there is no need to relocate bus stops or change bus routes during construction.

Pedestrian footpaths

Temporary detours would be required where construction activities occur across existing footpaths. Locations that would be impacted at La Perouse include:

- Footpath to access La Perouse Point
- Footpath between the proposed wharf location and the Boatshed (Café).

Locations that would be impacted at Kurnell include:

- Monument Track, between Princes Charles Parade and the proposed wharf location.

In order to maintain access to key tourist attractions at both La Perouse and Kurnell, alternative pedestrian routes would be developed as part of the Traffic Management Plan (TMP). Detours would be established as required during the construction period, with an aim to minimise any additional travel time for pedestrians where possible. As a result, pedestrians may have to travel slightly less convenient paths, but construction would not significantly impact access for pedestrians.

Cycle paths

Construction would not directly impact the existing cycling shared paths along Anzac Parade, La Perouse or Prince Charles Parade, Kurnell. Cyclists would be impacted the same as other road users, noticing an increase in heavy vehicles for a limited duration during construction.

Access

Construction of the project would not significantly impact on access for residents, businesses, employees or visitors of La Perouse or Kurnell. Although access to some roads, car parks and pedestrian footpaths would be impacted temporarily, alternative access routes would be provided.

No existing private property access would be affected during construction.

12.3.2 Assessment of marine construction impacts

During construction, there is potential for conflict between construction vessels and existing marine users.

Construction marine vessel movements would be associated with the following activities:

- Mobilisation and demobilisation of marine based equipment
- Movement of equipment due to weather
- Movement of equipment between La Perouse and Kurnell
- Supplying materials to the construction sites
- Construction worker movements from land to the marine construction sites.

Based on a 13-month construction period, the daily vessel movements during construction are estimated to be an average of eight vessel movements per day, with a maximum of 20 vessel movements per day. Appendix L (Navigational Safety Assessment) describes details of the types of vessels that would be required during construction and the approximate size and capacity. A range of floating crane barges, jack-up barges, tugs, supporting construction equipment, material storage barges and smaller transport vessels would be required.

Vessel movements for transporting material and construction equipment may come from outside Botany Bay to the project areas. These vessel movements would be infrequent and mostly during the site mobilisation and demobilisation. On a daily basis, vessel movements would involve transporting construction workers from Botany Bay to the project areas. It is expected that the majority of marine vessel movements would happen during daylight hours as described in section

12.3.1, however where required marine vessels movements may have to take place out of the above listed standard hours due to weather.

A maritime exclusion zone would be marked by buoys to restrict access to make sure that no recreational or other vessels enter the construction area and risk interfering with construction work vessels. This would cause an inconvenience for vessels closer to the shore but would not restrict access to areas beyond the construction boundary within Botany Bay.

The maritime exclusion zone would be located outside of the shipping channel. Any vessel movements would not restrict access for shipping and would have to give way to any shipping operations.

Appendix L (Navigational Safety Assessment) assesses the risk ratings for construction impacts. With required safety protocols in place, the likelihood of these impacts occurring (such as a conflict between shipping vessels and construction vessels) is unlikely or rare, but the consequence is moderate to major. Therefore, residual impacts equate to be moderate to high.

Swing moorings

Since the time of preparing Appendix L (Navigational Safety Assessment) the swing mooring data was updated. There are now only three swing moorings at Frenchmans Bay, La Perouse which need to be relocated as they are within the construction boundary:

- One public mooring (Reference CBB225)
- Two commercial/private moorings (Reference LD007 and LD009).

These moorings would be permanently relocated by Transport for NSW before works start in accordance with mooring management procedures. The moorings would be relocated within Botany Bay. Mooring users would be temporarily affected whilst these moorings are relocated. There would be no impacts once the moorings are relocated.

12.3.3 Assessment of land operation impacts

The ferry service would be operational during daylight hours, therefore the highest traffic and parking generation from the project is expected to be during daytime hours, and on weekends or public holidays.

Road network and intersections

The expected passenger numbers for a design year of 2036 is 149,600 annually. Section 6.1 of Appendix K (Landside Traffic and Transport Assessment Report) considers the private vehicle trips demand and analyses the impact this would have the existing intersection performance. Section 6.2 of Appendix K (Landside Traffic and Transport Assessment Report) compares the existing traffic conditions (2020) against future predicted trips with and without the project in 2036. The results show there would be capacity at each intersection to accommodate additional private vehicle trips associated with the project. Despite the increase of vehicles, the LoS rating would remain unchanged at A (very good) and the DoS rating would remain well below the desirable maximum of 0.8.

Parking

The demand analysis in section 6.1 of Appendix K (Landside Traffic and Transport Assessment Report) was carried out to understand the parking demands from the operation of the project. The analysis shows that although La Perouse would experience an increase in visitors, the project would also divert passengers from La Perouse to Kurnell (ie instead of driving to La Perouse, visitors coming from the south would park at Kurnell and use the ferry to travel to La Perouse).

At La Perouse, existing parallel spaces would be reconfigured to provide 13 additional 90-degree angle spaces. Parking on the southern side of Anzac Parade would be reconfigured to two kiss and ride spaces, three accessible spaces and two no-parking bays (required for accessible spaces). Based on the demand analysis, the proposed car parking would meet the demand from the operation of the wharves and would not increase parking congestion at La Perouse.

At Kurnell, the demand analysis shows 30 parking bays would be required to offset the additional demand from the project. The proposed provision of at least 34 parking spaces (including two accessible and two kiss and ride spaces) within the National Park would cater for this demand, therefore additional demand for parking from the operation of the project would not cause a parking deficit. The 34 car parking spaces within the National Park is not part of this project and will be delivered by National Parks and Wildlife Services separately.

The kiss and ride bays proposed at both La Perouse and within the National Park at Kurnell would be used for a drop-off area, where drivers can drop passengers off close to the wharves, but not park.

Accessible parking

The accessible parking bays as described above would enable people with limited mobility to park and use the facilities provided by the project. At Kurnell, the pedestrian path from the proposed car parking in the National Park would be upgraded to be DDA compliant.

The wharves would be designed to meet DDA standards, as required for all public transport infrastructure.

Public transport

There would be no changes to the existing public transport bus services or bus stops. The existing bus stops at La Perouse and Kurnell would not be impacted by the project.

The operation of the project would have a positive impact of providing a new public transport connection between La Perouse and Kurnell.

The ferry service would help connect with future transport plans such as the rapid bus routes and metro line proposed in the South East Sydney Transport Strategy (Transport for NSW, 2020).

Greater accessibility between the two sites would provide benefits for the residents, businesses, employees and visitors of La Perouse and Kurnell (refer to Chapter 14 (Socioeconomic) for further assessment of community benefits).

Pedestrian footpaths

The wharf-tie in areas at both La Perouse and Kurnell would include waiting areas for pedestrians which would connect to existing pedestrian footpaths. Footpaths would also be provided around the reconfigured car parking areas at La Perouse.

Monument Track at Kurnell would be reinstated following construction activities to provide pedestrian access to the proposed wharf.

The operation of a ferry service would provide access between La Perouse and Kurnell and encourage pedestrians to explore both sides of the National Park.

Cycling

The project would not restrict access to any existing cycling routes. On the contrary, the ferry service would improve connectivity for cyclists by providing a means to travel between La Perouse and Kurnell. This would provide a connection between two existing cycling routes (at La Perouse headland, and Kurnell).

The project would improve cycling infrastructure by providing 10 bicycle rails at La Perouse, with capacity to accommodate 20 bicycles. Bicycle rails at Kurnell would be considered as part of the wider Kamay Botany Bay National Park Kurnell Master Plan works and will not be delivered as part of this project.

Access

Once operational, the project would not restrict any public or private access for any residents, businesses, employees or visitors of the La Perouse and Kurnell. The project would improve access between La Perouse and Kurnell by providing the ferry service.

12.3.4 Assessment of marine operation impacts

Positive impacts

As well as providing a new public transport connection between La Perouse and Kurnell, the wharves would provide several positive impacts associated with increased accessibility for maritime users, as follows:

- The wharves would provide a safe berth for Marine Rescue NSW, NSW Police Marine Area Command or NSW Maritime vessels during periods of increased recreational waterborne activities when the risk of incidents is likely to be higher. Such use will provide a timelier response to on water incidents or accidents.
- The wharves would provide landside emergency services, including Police, Ambulance and Fire, with safe access to Botany Bay. Persons or vessels in need of assistance would use the wharves to enable emergency services personnel to help people needing medical assistance.
- The ferry service would introduce professional seafarers into the area who are well trained and adequately resourced. They could help initiate and coordinate a response and also respond in their own right in an otherwise fairly remote area.
- The wharves are located close to the entrance to Botany Bay which would provide safe havens for small vessels that get into trouble in the outer area of the Bay. This would be closer than the existing options.

Conflict with shipping vessels

As discussed in Chapter 5 (Project description), each ferry berth would be capable of accommodating up to three vessels per hour resulting in approximately 36 vessel movements a day during daylight hours. It is anticipated that vessels movements would be higher on weekends (and likely public holidays) than on weekdays.

The ferry service would transit between the proposed wharves at La Perouse and Kurnell within the swept ferry path (refer to Chapter 5 (Project description)). This is the area within which ferries would move between the two wharves. The actual ferry swept path may differ to suit local wind, wave and other vessel movements at the time of crossing.

The introduction of a ferry service could increase the possibility of vessel conflict with shipping operations. Freight and fuel vessels travelling to Port Botany and the Kurnell Terminal Wharf would have priority over the ferry service (refer to Appendix L (Navigational Safety Assessment) for further details).

If activities associated with the Port (such as maintenance dredging of the shipping channel) are required within the shipping channel, the ferry service would have to adjust its course to avoid this activity. Any alterations to the ferry course would be temporary in duration and are not expected to significantly delay the operation of the ferry service.

Conflict with other maritime users

In addition to a ferry berth, the wharves provide for recreational and commercial vessel berthing. On average it is expected that around two recreational vessels and four charter vessels would use each wharf per day, and the vessel movements would be highest on weekends and on public holidays. This is likely to increase the number of recreational and commercial vessels within the La Perouse and Kurnell areas of Botany Bay and could increase the risk of vessel conflicts.

The wharves are designed specifically to have separate berths for the ferry service from other commercial or recreational vessels. This would reduce the likelihood for conflict between the ferry operation and other vessels.

The path for the operation of the ferry service is across the shipping channel which is unlikely to be a popular fishing, diving or snorkelling area due to the existing movement of shipping vessels.

Any aquatic events that are scheduled near the ferry wharves would have to be managed accordingly to avoid ferry vessel movements.

Recreational activities such as diving, swimming and fishing would have to avoid the path of ferries. As multi-user wharves, these activities would be provided for where they do not conflict with the ferry service. Management of activities around the wharves would be subject to Transport for NSW operational management systems.

Swing moorings

Any swing moorings at La Perouse which would be in the path for the ferry operation would have been permanently relocated prior to construction. There are no ongoing impacts to any swing moorings at La Perouse or Kurnell.

Navigational hazards

The wharves are designed to accommodate a range of vessel sizes and users. The use of the wharves would be managed under existing Transport for NSW operational management systems which include robust safety regulations. This would control the permitted use of the wharves and navigational safety requirements.

12.4 Environmental management measures

Potential traffic and transport impacts would be managed through a suite of management plans for both construction and operation of the project as listed in Table 12-3 below.

Table 12-3: Environmental management measures for traffic and transport

Impact	ID	Environmental management measure	Responsibility	Timing
Landside traffic risks during construction	T1	A Traffic Management Plan (TMP) will be prepared in accordance with Traffic Control at Work Sites - Technical Manual (Transport for NSW, 2020h) and QA Specification G10 - Traffic Management (Transport for NSW, 2020i). It will be implemented under the Construction Environment Management Plan (CEMP). The TMP will focus on maintaining general traffic flow, specifying appropriate site accesses, construction parking and construction traffic routes. The TMP will be prepared in consultation with National Parks and Wildlife Service, Randwick City Council and Sutherland Shire Council.	Contractor	Pre-construction and construction
Parking within Kamay Botany Bay National Park	T2	Transport for NSW will continue to liaise with National Parks and Wildlife Services to support its delivery of additional car parking within the Kamay Botany Bay National Park at Kurnell prior to operations.	Transport for NSW National Parks and Wildlife Service	Pre-construction and construction
Construction parking at La Perouse	T3	Construction worker parking along Anzac Parade at La Perouse will be avoided during peak periods (weekends). Consideration of a temporary parking facility at La Perouse will be considered during development of the TMP.	Contractor	Pre-construction
Conflict between cyclists and construction vehicles	T4	Interaction between cyclists and construction related vehicles will be managed and proposed alternative routes provided within the TMP.	Contractor	Pre-construction

Impact	ID	Environmental management measure	Responsibility	Timing
Conflict between pedestrians and construction vehicles	T5	Where disruption or closure of pedestrian routes is required during construction, alternate pedestrian routes, appropriate signage and safe access will be provided in consultation with Randwick City Council, Sutherland Shire Council and National Parks and Wildlife Services.	Contractor	Pre-construction
Emergency vehicle access	T6	Emergency vehicle access will be maintained during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.	Contractor	Construction
Conflict between marine construction works and other marine users	T7	A Marine Works Management Plan (MWMP) will be prepared in consultation with the Port Authority NSW (including Harbour Master), Transport for NSW, and other relevant stakeholders. The plan will define exclusion zones, methods of marking the zones, clearance distances, mooring plans, communication protocol, emergency and incident response procedures, vessel movements, contact details of all parties and responsible persons, and transit routes. The MWMP will be consistent with the Biodiversity Management Plan.	Contractor	Pre-construction and construction
Conflict of water users and construction vessels	T8	Maritime exclusion zones will be established to prevent unauthorised vessels entering the area. These zones will be clearly defined to communicate access for other water users and will be lit to account for the measures in National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds, and Migratory Shorebirds (Australian Government Department of the Environment and Energy, 2020).	Contractor	Construction
Swing moorings conflicting with construction boundary and operational swept ferry path	T9	Moorings that conflict with construction or the operational ferry swept path will be relocated outside of the construction boundary in accordance with Transport for NSW standard mooring relocation processes. Mooring relocation will be undertaken in consultation with Port Authority NSW and notify any affected stakeholders.	Transport for NSW	Pre-construction
Increase in commercial and recreational vessels using the area	T10	Consultation and notification will be carried out before the commencement of operations to ensure the surrounding maritime operations, including recreational boating, are informed about the project.	Transport for NSW	Operation