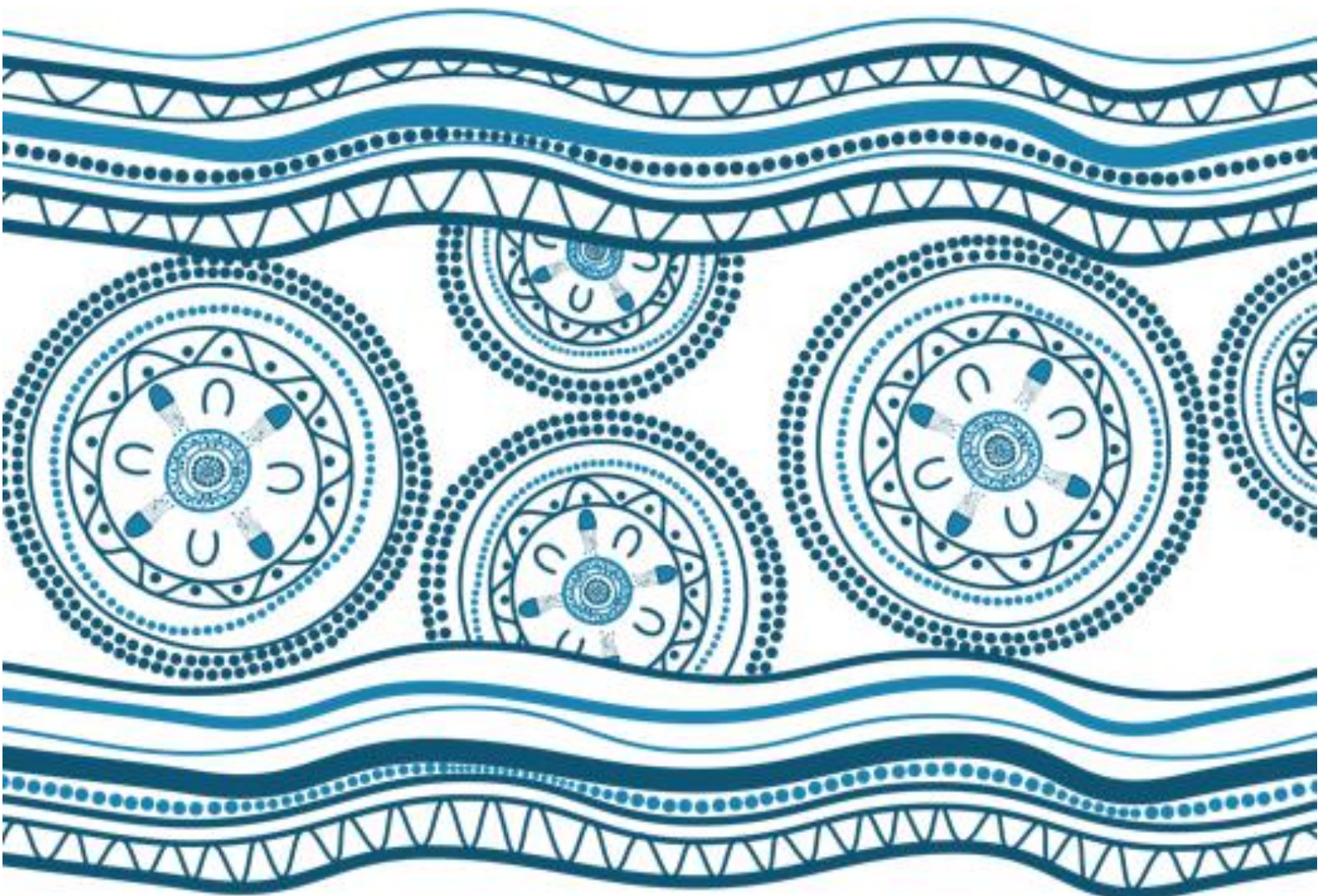


Chapter 4

Project development and alternatives



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4 Project development and alternatives

This chapter describes the project development, including the alternatives that were considered as part of the development process and explains how and why the project was selected as the preferred option. Design refinements for particular elements of the project are also presented, demonstrating how the project was designed to avoid or minimise adverse impacts.

4.1 Project development overview

The progression of the project to date has included several years of investigations and studies, as reported in the following documents:

- La Perouse – Kurnell and Botany Bay Ferry Service, Feasibility Study (Issue 2) (Patterson Britton & Partners, 1999)
- Draft feasibility study (Transport for NSW, 2015a)
- Updated feasibility study against submissions (Transport for NSW, 2016a)
- Strategic Business Case and Final Business Case were developed and assured in accordance and compliance with the NSW Infrastructure Investor Assurance Framework (Infrastructure NSW, 2020a).

Throughout the project development, the design options have been considered based on their ability to meet the project objectives which are listed in Chapter 3 (Strategic justification and project need).

4.2 Stakeholder engagement

Consultation with key stakeholders (ie State agencies, local government, the La Perouse Local Aboriginal Land Council, potential user groups, potential contractors, industry associations and the local community) has been undertaken throughout the project's development which has influenced the project design (refer to Chapter 6 (Consultation)). Workshops have been held throughout 2020 with key stakeholders to develop the preferred option. Community consultation and feedback has been ongoing since the project inception including submissions on the *Ferry Wharves at La Perouse and Kurnell Final Feasibility Report* (Transport for NSW, 2016a) (referred to as Feasibility Report), community consultation sessions and through the 'have your say' website.

4.3 Alternatives

The project development process considered alternative ways of meeting the project objectives of providing an alternative means of transport between La Perouse and Kurnell. The following alternatives were considered:

- Do nothing
- Alternative infrastructure such as a tunnel or bridge
- Upgrade and use existing wharves (such as the Kurnell Port and Berthing Facility Wharf)
- Increased public transport options.

These alternatives were discounted for the following reasons:

4.3.1 Do Nothing

A 'do nothing' alternative would result in a continued disconnection for people seeking to access the culturally significant Kamay Botany Bay National Park (the National Park). The transport connections would remain limited to road access and average travel times of 40 to 90 minutes between La Perouse and Kurnell for private vehicles, and longer for public transport trips. The visitor potential of the area would remain limited. Significant barriers would remain for local Aboriginal people and broader communities better to engage with the National Park and areas of cultural significance. There would be missed socioeconomic opportunities for commercial

operators to reinstate a passenger waterborne service, recreational boats, commercial tour boats and recreational fishers.

The 'do nothing' alternative was therefore discounted as a feasible alternative.

4.3.2 Tunnel or bridge

A tunnel or bridge connecting La Perouse and Kurnell would be prohibitively expensive. A bridge would also be far more physically and visually intrusive and require a larger construction footprint with significant impacts on a culturally important area compared to the proposed ferry wharves option.

The tunnel or bridge alternative was therefore discounted as a feasible alternative.

4.3.3 Existing wharf

The use of the existing Kurnell Wharf, associated with the Kurnell Port and Berthing Facility was assessed as being unsuitable for passenger ferries and commercial or recreational vessels from a technical, condition and safety perspective. The wharf could be upgraded; however, this would create conflict between existing shipping vessels that use the wharf and the ferries and recreational vessels. The Kurnell Terminal Wharf is not within the National Park, and therefore would increase walking distances for accessing the Kurnell side of the National Park.

The existing wharf option was therefore discounted as a feasible alternative.

4.3.4 Increased public transport options

Whilst increasing the frequency of bus services would not be prohibitively expensive to introduce, it is not within the scope of the Interagency Project Agreement: Botany Bay Ferry Infrastructure (NSW Office of Environment and Heritage and Roads and Maritime Services, 2018) and would not achieve the project objective of providing tourism related commercial vessels and recreational vessel access. A water taxi service would still require wharves at both La Perouse and Kurnell and it may not be equitable for all users as it would be less affordable and may not provide compliant disability access.

This option was not considered to meet the project objectives and was discounted.

Any of these alternatives would result in the Commonwealth and NSW Governments not delivering upon their 2018 commitments for reinstatement of the wharves as outlined in the Project Agreement for the Kamay 250th Anniversary Project (Commonwealth of Australia and NSW Government, 2018). Additionally, the objectives of the Kamay Botany Bay National Park Kurnell Master Plan (NSW DPIE, 2019) would not be fully realised, as improving access and the visitor experience to the National Park is a critical component of this Plan.

4.4 Options development

The option to create waterborne access to the National Park for passenger ferries, tourism related commercial vessels and recreational vessels through building two new wharves was developed following investigation of the alternatives as discussed above, as it would:

- Improve the ease of access between La Perouse and Kurnell
- Improve the sense of arrival into the two culturally significant sites
- Enable a ferry service that assists the Kamay Botany Bay National Park Kurnell Master Plan to deliver upon its objectives.

The wharf options development followed three key stages as shown in Figure 4-1.



Figure 4-1: Key stages in options development

4.4.1 Stage 1: Site selection

The Feasibility Report (Transport for NSW, 2016a) considered various locations for the wharves. Three locations at La Perouse and three locations at Kurnell were considered. These options included:

- La Perouse (see Figure 4-2):
 - Option LP1: Northern end of Frenchmans Bay
 - Option LP2: Southern end of Frenchmans Bay at the site of the old ferry wharf
 - Option LP3: Astrolabe Cove north of Bare Island.
- Kurnell (see Figure 4-3):
 - Option K1: Eastern end of Silver Beach, near the corner of Prince Charles Parade and Captain Cook Drive
 - Option K2: At the site of the old wharf and existing viewing platform near Captain Cook's Obelisk
 - Option K3: Near Sutherland Point and approaching the open parkland fronting the National Park Visitor's Centre.

A semi-quantitative multi-criteria assessment of the location options was undertaken in 2015 by a project team consisting of engineers, urban designers and environmental specialists. This was carried out by assessing each option against specific criteria for the project and a comprehensive review of key spatial opportunities and constraints. The criteria used and ranking outcomes are provided in Table 4-1.

Table 4-1: Multi-criteria assessment for wharf location options

Criteria	La Perouse			Kurnell		
	LP1	LP2	LP3	K1	K2	K3
Proximity to existing road and public transport network	3	1	1	1	2	3
Available area for landside infrastructure (ie car parking)	1	2	2	1	1	2
Proximity to key social, cultural and historical features	3	1	1	3	1	2
Protection offered from waves and currents	1	1	3	1	1	3
Impact on sensitive ecological areas	2	2	1	3	1	1
Impact on sensitive heritage areas	1	2	2	3	2	1
Distance offshore to the required water depth	2	2	1	3	2	1
Flexibility for potential recreational boating launching usage	1	1	3	1	3	3
Total (lowest score is best)	14	12	14	16	13	16

Through this assessment, Options LP2 (see Figure 4-2) and K2 (see Figure 4-3) were identified as the preferred locations. This was confirmed in 2015 by a Project Control Group including Transport for NSW, National Parks and Wildlife Services, Randwick City Council and Sutherland Shire Council.



Figure 4-2: Feasibility options at La Perouse



Figure 4-3: Feasibility options at Kurnell

4.4.2 Stage 2: Develop design options

As part of the strategic design process, a long list of design options was developed for the two preferred locations (Options LP2 and K2). The long list of options was informed by the findings of the following technical studies:

- Vessel fleet and future trends study
- Coastal modelling study
- Vessel motion study
- Geophysical and bathymetric site investigation
- Constructability assessment
- Architectural and urban design considerations
- Traffic and transport survey and study
- Wharf head options assessment
- Market soundings and stakeholder consultation.

The long list of wharf options was evaluated against the project objectives and two options were developed for each location; a 'do minimum' and 'do maximum'. The two options were established to meet functional specification requirements, operational capacity needs and customer experience expectations. These two design options are described further below.

Do minimum design solution

The do minimum design solution would involve the following elements (refer to Figure 4-4 and Figure 4-5):

- Construction of wharves at La Perouse and Kurnell to accommodate a ferry/commercial vessel service and limited recreational boating functions.
- Provision of wharves which achieve full statutory accessibility compliance and meet the minimum technical and functional requirements for transport customers.
- Compatible with the Kamay 2020 Project landside improvements.

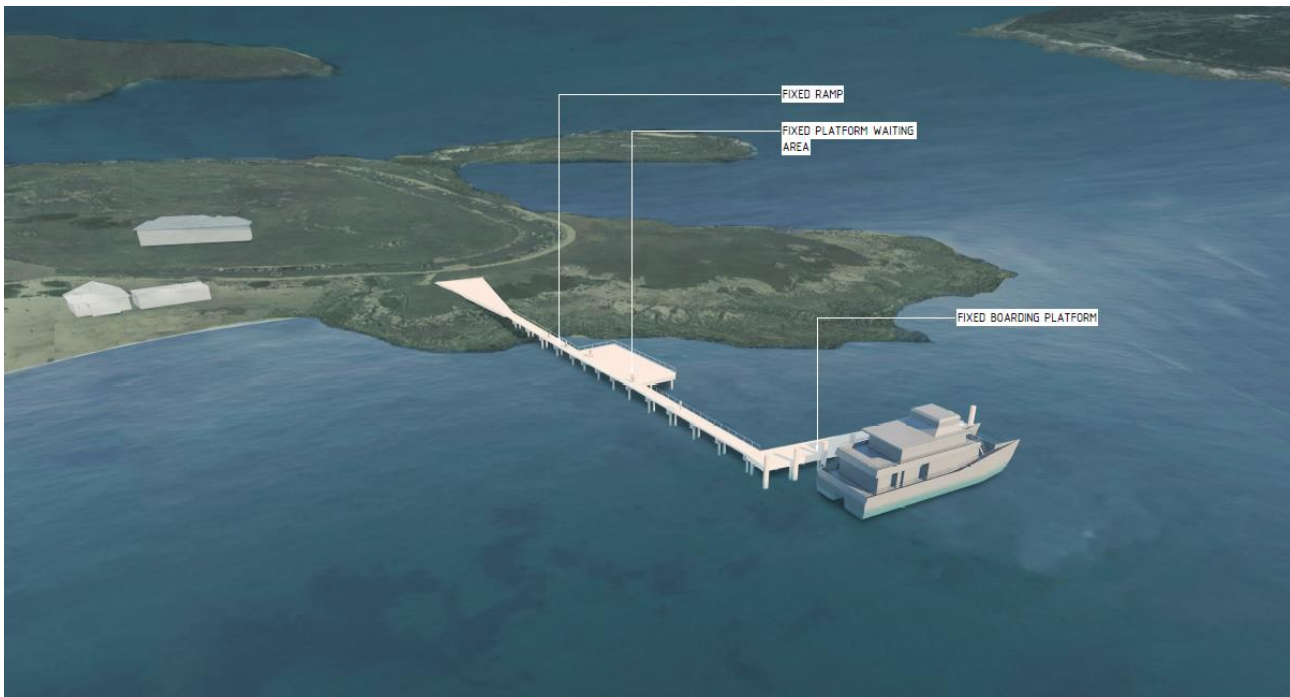


Figure 4-4: Do minimum option at La Perouse

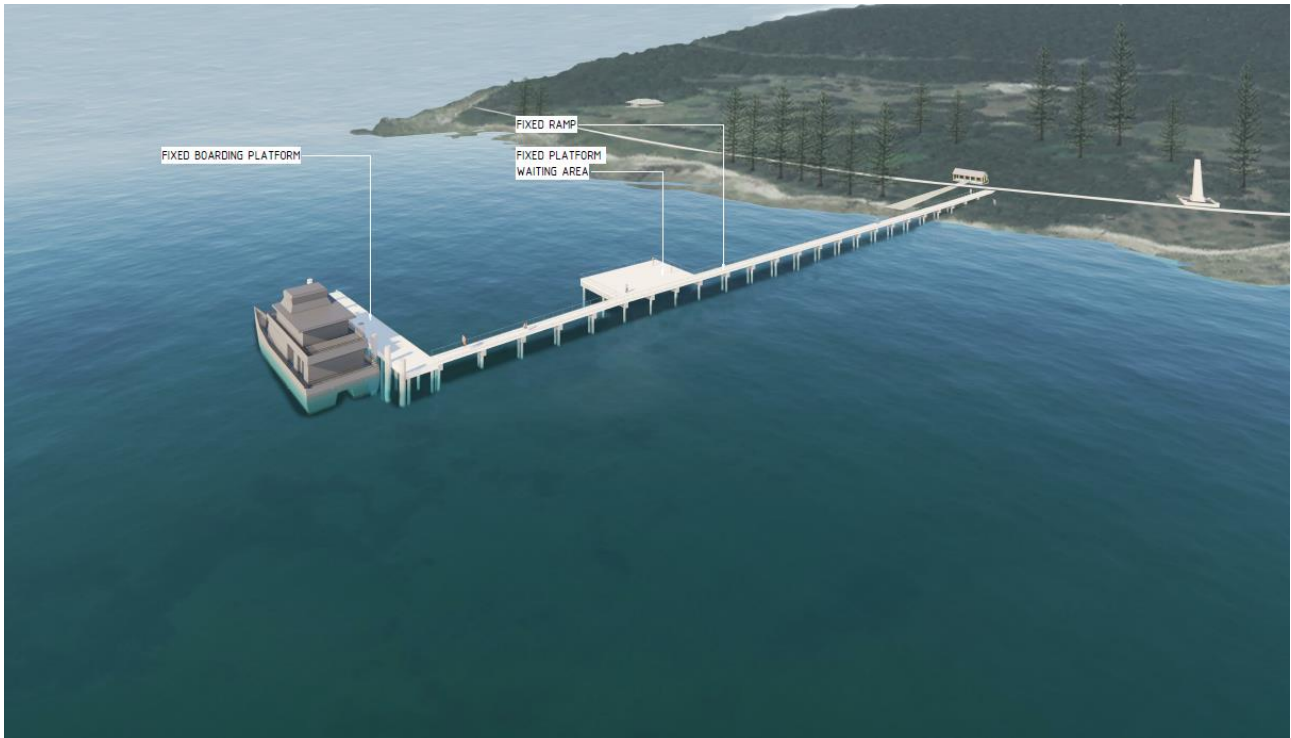


Figure 4-5: Do minimum option at Kurnell

Do maximum design solution

The 'do maximum' design solution would be as per the 'do minimum' option, with the following added benefits (refer to Figure 4-6 and Figure 4-7):

- Provides a higher architectural treatment, landscaping and inclusion of cultural interpretation, which increases placemaking and sense of arrival to the wharves
- Provides a dedicated multi-berth for recreational boaters
- Provides added landside amenities including toilets, crew facilities, bike storage, additional car parking.

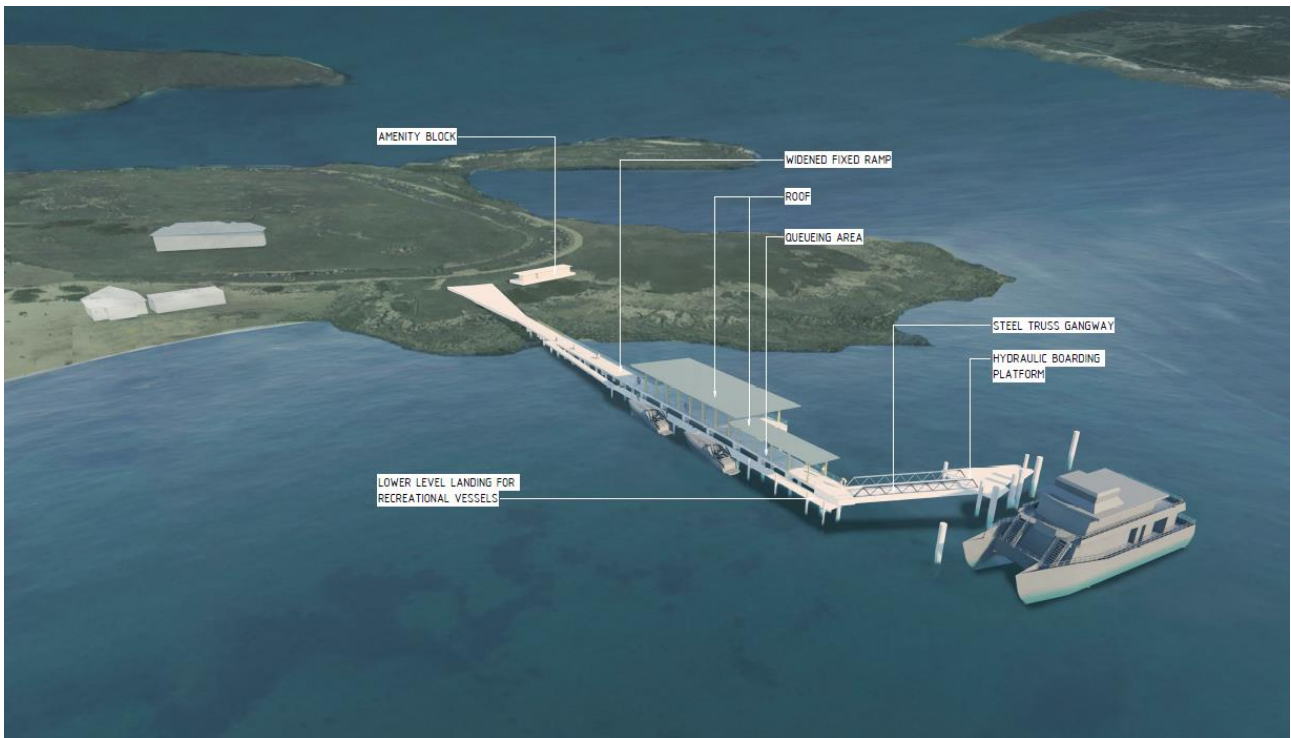


Figure 4-6: Do maximum option at La Perouse



Figure 4-7: Do maximum option at Kurnell

4.4.3 Stage 3: Refine options

An expert review panel consisting of independent experts from Mott MacDonald and NSW Treasury undertook a review of the two design options between 29 May 2020 and 24 June 2020. The panel assessed the 'do minimum' and 'do maximum' options considering their ability to achieve the objectives of Transport for NSW and to optimise value for money for Government. Among the key recommendations of the panel was the view that the desirable ferry service can be delivered with a low-cost design solution for the wharves. The 'do maximum' option had higher costs associated with wider and longer wharves, a complex hydraulic wharf and larger facilities. Due to this, a design value management process was undertaken.

Two workshops took place on 3 and 18 June 2020 between the Arup design team, Transport for NSW and NPWS to evaluate the 'do maximum' option and remove the non-essential elements to arrive at a final concept design. Each scope item was assessed against:

- Cost impact
- Environmental impact
- Alignment with project objectives
- Qualitatively assessed against benefits each scope item delivers
- Planning and assessment requirements (ie SEARs).

A summary of the value management process is provided in Table 4-2.

Table 4-2: Value management process

Scope Item	Recommendation	Outcome
Waterside scope		
Displacement tonnage	The maximum design vessel was scaled back in size following a ferry fleet review, as such the wharf infrastructure could be optimised due to the reduced vessel draught and berthing energy exerted on the structure.	Adapted
Draught / water depth		
Shelter / roof	The roof was reduced to a more scaled-back option.	Adapted
Hydraulic platform	The hydraulic platform was removed due to limited benefits over a simpler fixed wharf ramp structure.	Removed
Dedicated recreational berth	An independent recreational berth that allows for additional vessels and users to berth and use the wharf was deemed essential.	Retained
Jetty width	The 4 m jetty width allows sufficient width for multiple users and meets DDA requirements.	Retained
Landside scope		
Landside amenities building	It was decided that toilets and changing rooms were not required as public toilets already exist at La Perouse and Kurnell.	Removed
Bike racks	These were removed from Kurnell wharf design (as bike racks would be delivered through the Kamay Botany Bay National Park Kurnell Master Plan) and retained for La Perouse.	Adapted
Car parking	Essential for the access for vehicle users and accommodate the additional demand generated by the wharves.	Retained
Additional car parking at La Perouse	Based on a traffic and transport report, it was decided not to provide additional car parking at La Perouse for pre-existing issues.	Removed
La Perouse bus stop relocation	Bus stop relocation was removed from the scope of the project as it should be provided for as part of wider public transport service upgrades.	Removed
Kurnell access path (Monument Track)	It is likely that demolition and reinstatement of the access path would be required to accommodate the utilities. Further consultation with Emergency Services would be carried out during detailed design to determine whether the footpath needs to be upgraded to accommodate emergency service vehicles.	Adapted

Following completion of the value management process, the concept design solution was confirmed, superseding the 'do maximum' and 'do minimum' options. End user requirements were then updated for the final concept design (refer to Table 4-3). These are performance requirements that the wharf facility and associated landside provisions must achieve through the design and construction process.

Table 4-3: Key scope items for concept design

Key scope	Description
Ferry design vessel	The wharf infrastructure is to accommodate small to medium sized ferry vessels (15 to 24 m length and a maximum 2 m draft). The wharf infrastructure is to accommodate larger sized and infrequent ferry vessels (up to 40 m in length with a maximum 2 m draft).
Ferry operational needs	Wharf facility and associated landside provisions to cater for a maximum of 450 people (225 boarding / 225 alighting) during busiest hours.
Recreational boating	Dedicated berth faces on both wharf structures to be provided for recreational or commercial boating use, fishing and other recreational activities and segregated from ferry operations.
Car parking spaces	The La Perouse site would provide an extra 13 standard spaces, two accessible and two kiss and ride car parking spaces. These car parks are approximately 100 – 175 m from the proposed wharf site. The Kurnell site would provide an extra 19 standard, two kiss and ride and two accessible car parking spaces.
Low voltage power and communications	At each wharf, low voltage power to be provided to service the following where applicable: <ul style="list-style-type: none"> • 240v power outlet (separately metered in a meter box) • Communication equipment • Ticket machines (if applicable) • Electronic timetable pods • CCTV • PA system.
Stormwater	At each site, stormwater drainage would be considered as part of the design such that all paved areas drain freely.
Weather protection	At each wharf, customers would be protected from inclement weather by the proposed roof shelter at the wharf waiting area and to allow access to ticketing and other information
Seating, standing and waiting	At each wharf, customers would be provided with: <ul style="list-style-type: none"> • Comfortable seating • Additional standing and / or leaning areas • Space for wheelchair and / or prams • Priority seating (where relevant) for elderly and disabled customers and parents with prams.
Customer information	Customers would be provided with information on wharves and at the landside wharf approaches including: <ul style="list-style-type: none"> • Service information including arrival and departure times for ferries • Information on fares and ticketing • All information is provided in a format that is easy for customers to read and understand.
Wayfinding	Wayfinding and interpretive material should be consistent with the themes and objectives identified within the Kamay Botany Bay National Park Kurnell Master Plan (NSW DPIE, 2019).
Lighting	At each wharf, lighting elements along the wharf and approach would be designed to: <ul style="list-style-type: none"> • Provide consistent luminance • Prevent glare, reflections, or dark spots • Prevent light pollution to surrounding areas.

The selection of the preferred option considered the ecologically sustainable development principles as it:

- Adopts a simple and cost-effective design
- Provides for current and future generational use of the wharves
- Provides a solution which minimises environmental impact. This EIS further assesses impacts and mitigates these through the precautionary principles approach.

Chapter 27 (Project justification and conclusion) further considers the project and the principles of ecological sustainable development.

The preferred option would meet the project objectives listed in Chapter 3 (Strategic justification and project need), by providing waterborne access between La Perouse and Kurnell, would achieve value for money and would promote ecologically sustainable development principles as outlined above.

4.5 Minimising environmental impacts

A number of environmental impacts have been avoided or minimised throughout the development of the project. These include:

- Locating the wharves in a location that minimises impacts on sensitive seagrass and rocky reef marine habitats
- Using the location of the previous wharf structure to minimise disturbance to undisturbed land
- Reducing the land-side amenities footprint to avoid potential impacts to heritage features and archaeology, and terrestrial ecology
- Reconfiguring existing car parking areas to maximise space while limiting disturbance to land
- Retaining sensitive vegetation along Captain Cook Drive at Kurnell
- Utilising temporary construction platforms
- Carrying out archaeological and contamination test excavations to identify existing ground conditions and heritage locations.

4.5.1 Car parking at Kurnell

The concept design scope included reconfiguring the existing car parking spaces along Captain Cook Drive to create an additional 19 spaces including two kiss and ride spaces and two accessible spaces. This aligned with the car parking spaces shown in the Kamay Botany Bay National Park Kurnell Master Plan. During consultation for design development, Sutherland Shire Council indicated that they were no longer supportive of this solution and requested that Transport for NSW exhaust all other parking opportunities within the National Park. Additionally, community members raised concerns over the removal of trees in this location.

To resolve these issues, Transport for NSW further investigated the options available for locating the required car parking spaces within the National Park. NPWS confirmed that they will provide these car parking spaces within the National Park to service the additional car parking demand that is expected to be generated by the Project. This design alternative option has benefits for protecting established vegetation within the National Park and Council managed land along Captain Cook Drive.

The car parking to be provided within the National Park will include 34 new car parks (including two accessible and two kiss and ride spaces) which will be available for use prior to completion of the project. There will be pedestrian access from the car park to the wharf to ensure DDA compliance is provided. This car parking within the National Park will be provided by NPWS and will be subject to a separate planning approval from this EIS.

4.6 The project

The preferred option and concept design for the project was identified and refined through an extensive assessment and review process to ensure it best meets the project objectives and limits any environmental impacts.

The preferred option comprises:

- Demolition of the existing viewing platform at Kurnell
- Construction of temporary ancillary works including access roads, compound areas, stockpiles, fencing and temporary building platforms (including a temporary causeway at Kurnell and temporary crane platform at La Perouse)
- Relocation of swing moorings at La Perouse
- Construction of two wharves on piles, one at La Perouse and one at Kurnell that would include:
 - A berth for passenger ferries (to cater for ferries between 15 metres to 40 metres in length)
 - A multi-user berth for commercial and recreational vessels (to cater for vessels between 2 metres and 20 metres long)
 - Sheltered waiting areas and associated furniture located on the wharves
 - Signage and lighting
- Landside paving and landscaping at the entrance to the wharves
- New footpaths connecting the entrance of the wharves to the existing footpaths
- Reconfiguration of existing car parking areas at La Perouse to increase the number of spaces, and associated footpath changes to accommodate these additional car parking areas
- Bicycle racks near the La Perouse wharf
- Installation of utilities to service the wharves including power and water.

The preferred option for the project is presented in detail in Chapter 5 (Project description).