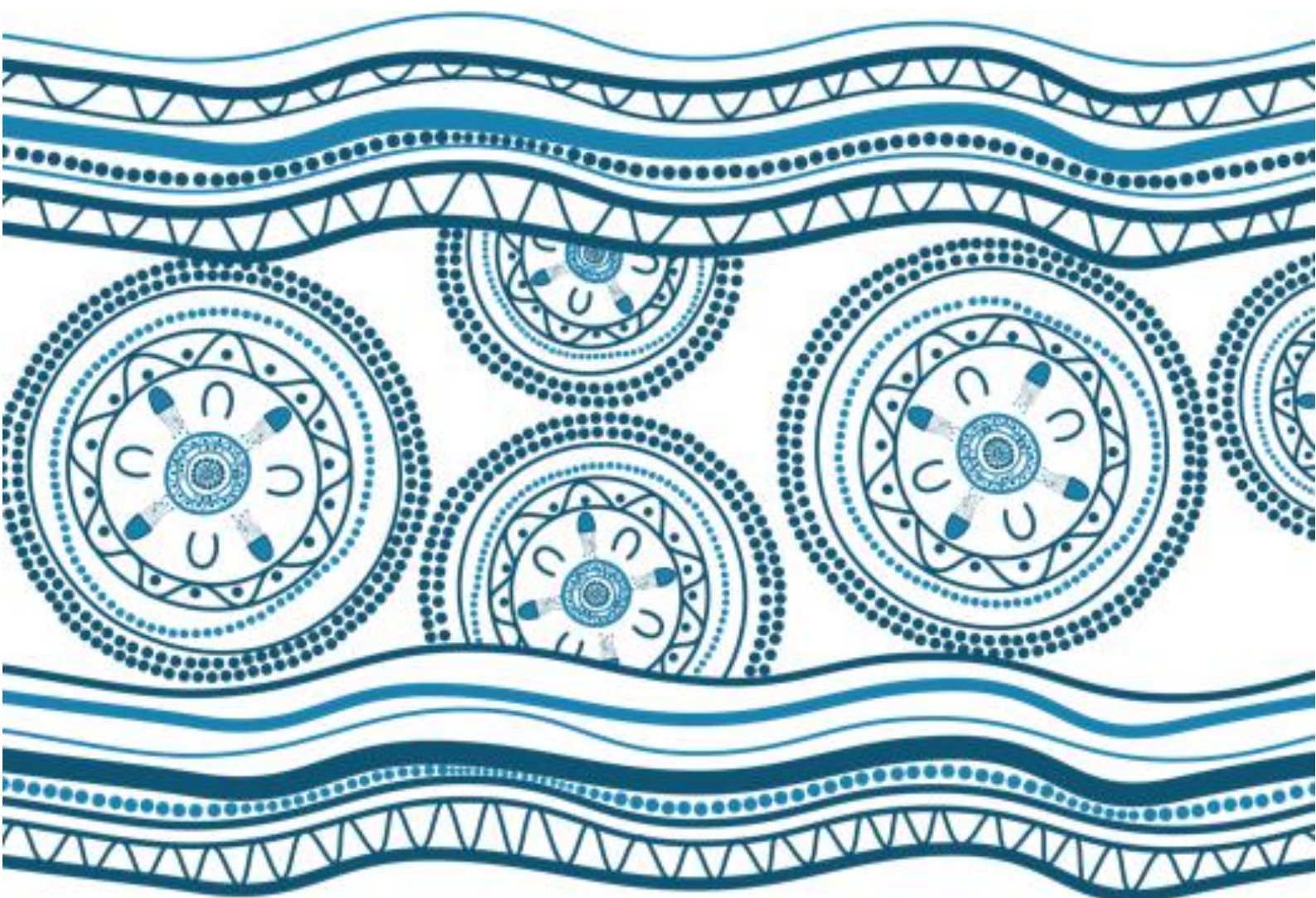


Chapter 22

Sustainability



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22 Sustainability

This chapter presents a summary of the sustainability drivers including policies, frameworks and best practice guidelines that are applicable to the project. These are used to inform and embed sustainability practices throughout the planning, procurement, construction, operation, and management stages.

22.1 Assessment methodology

A qualitative review of policies, guidelines and other documentation that dictates and drives sustainability outcomes for the project was carried out. This includes relevant Transport for NSW (including legacy Roads and Maritime Services (RMS)), regional, State and national policies to identify key themes, objectives and targets for sustainability for the project listed in section 22.1.1. From these documents, a list of initiatives was derived for the project. The sustainability guidelines do not determine a target sustainability rating level, rather, they require the implementation of these guidelines in all phases of the project.

22.1.1 Policy framework

The policy documents reviewed included:

- Environmental Sustainability Strategy 2019-2023 (NSW RMS, 2019)
- Sustainability in Infrastructure Design and Construction (NSW RMS, 2016)
- *National Greenhouse and Energy Reporting Act 2007* (Cth)
- Smart Cities Plan (Australian Government, Department of the Prime Minister and Cabinet, 2016)
- State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)
- Climate Change Policy Framework (NSW Office of Environment and Heritage, 2016)
- NSW Climate Change Net Zero Plan Stage 1: 2020-2030 (NSW Department of Planning, Industry and the Environment, 2020f)
- Infrastructure NSW Gateway Review (Infrastructure NSW, 2020b)
- Greater Sydney Regional Plan – A Metropolis of Three Cities (Greater Sydney Commission, 2018)
- Transport for NSW Environment and Sustainability Policy (Transport for NSW, 2020b)
- Transport for NSW Statement of Commitment PO-002 (Transport for NSW, 2019b)
- Transport for NSW Sustainable Design Guidelines (Version 4.0) (Transport for NSW, 2017)
- Beyond the Pavement (Transport for NSW, 2020a).

22.2 Sustainability implementation

Potential sustainability impacts of and on the project are far ranging due to the holistic definition of sustainability that aims to balance environmental, social and economic outcomes. These impacts have the potential to occur at a geographical scale well beyond the project's footprint and at a timescale beyond the project's construction and operational design life. Equally, the benefits that the project can provide, also occur at a time and a geographic scale beyond those of the immediate project.

The draft sustainability framework below aims to define objectives and propose initiatives which address potential impacts and drive benefits. This list of initiatives is not exhaustive and may be added to during future project stages. Measures of success will be established were relevant for these objectives or initiatives. This framework would be reviewed following detailed design and prior to construction of the project. The project will implement these sustainability objectives throughout all project stages.

Table 22-1: Draft sustainability framework and initiatives

Objectives & initiatives	Policy	Detailed design	Construction	Operation
Energy and greenhouse gas				
<i>Minimise energy use and reduce carbon emissions without compromising the delivery of services to our customers</i>	RMS Environmental Sustainability Strategy 2019-2023	<ul style="list-style-type: none"> The project aims to reduce construction related greenhouse gas emission from the project baseline greenhouse gas footprint (refer to Chapter 21 (Greenhouse gas)) 	<ul style="list-style-type: none"> The project will comply with the NSW Government Resource Efficiency Policy (GREP) Construction is able to be carried out from the water to maximise efficient construction processes, access, and transport 	<ul style="list-style-type: none"> The operation of the wharves will comply with the NSW Government Resource Efficiency Policy (GREP)
<p><i>Minimise energy use and reduce greenhouse gas emissions without compromising the delivery of services to customers</i></p> <p><i>Consider the energy management hierarchy helps conserve resources, drive down greenhouse gases and reduce air pollutants:</i></p> <ol style="list-style-type: none"> <i>Avoid the need for energy</i> <i>Use energy efficient technologies to reduce demand</i> <i>Substitute renewable in place of fossil fuel generated energy.</i> 	RMS Technical Guide Sustainability in Infrastructure Design and Construction	<ul style="list-style-type: none"> Ferry path designed to account for local conditions and to maximise ferry efficiencies (eg location, path, berthing angle). This aims to reduce travel times and fuel consumption Material quantities minimised where possible such as concrete volumes and pile numbers, reducing the embodied energy associated with construction Design has allowed for future provision of transition to an electric ferries fleet Lighting design minimises lumen levels to reduce glare and energy consumption (while maintaining the necessary technical requirements) LED lighting specified throughout the project The project improves the level of community access to other modes of transport (eg buses, cycle paths), reducing the reliance on private vehicles and subsequently reducing greenhouse gas emissions Products with a lower embodied energy used onsite where possible (eg geo-polymer concretes, recycled products) Materials that are durable, are low maintenance, and which have a 	<ul style="list-style-type: none"> The project will seek to achieve efficient movements of punts and barges used during construction, minimising any unnecessary trips, and avoiding fuel use where possible Awareness of energy and greenhouse gas emission principles to be included as a part of contractor induction program. 	<ul style="list-style-type: none"> The project provides a transport link between La Perouse and Kurnell, as an alternative to driving between the two headlands. This may encourage drivers to switch to public transport, therefore reducing reliance on private vehicles, potentially reducing greenhouse gas emissions.

Objectives & initiatives	Policy	Detailed design	Construction	Operation
		<p>long design life are recommended (eg stainless-steel balustrades)</p> <ul style="list-style-type: none"> Project design has ensured material quantities for construction are minimised. 		
Climate resilience				
<p><i>Design and construct transport infrastructure to be resilient or adaptable to climate change impacts</i></p> <p>Targets:</p> <ul style="list-style-type: none"> Assess climate change risks for all potentially affected projects and programs Address all identified climate change risks ranked as high or above during project planning. 	RMS Environmental Sustainability Strategy 2019-2023	<p>A climate change risk assessment and workshop were conducted to identify high and extreme risks for the project. Strategies to mitigate these risks have been incorporated into concept design (refer to Chapter 19 (Climate change)).</p> <p>Outcomes from the assessment include:</p> <ul style="list-style-type: none"> Concrete slip resistant finishes and slip resistant mesh flooring that allows water flow Weather protection over jetty lengths Deck level consideration for increased wave load and sea level rise Fixed structure levels have been set to be suitable for current and future sea level rise Berthing orientation chosen to account for extreme weather events Appropriate fenders and mooring points to account for sea level rise Roof structure wind impact to be assessed in design Modular design features for deconstruction / replacements Carbonation modelling for the concrete mix to avoid cracking Internal controls and seating to avoid exposure to the elements. 	<ul style="list-style-type: none"> Climate change projections do not allow for the quantification of immediate climate change risks on the project and the processes of construction. 	<ul style="list-style-type: none"> The operation of the wharves will comply with the NSW Government Resource Efficiency Policy (GREP).
<p><i>To design and construct transport infrastructure to be resilient to climate change impacts.</i></p>	RMS Technical Guide Sustainability in Infrastructure Design and Construction			

Objectives & initiatives	Policy	Detailed design	Construction	Operation
Resource Use, Materials and Waste				
<p><i>Minimise the use of non-renewable resources and minimise the quantity of waste disposed to landfill.</i></p> <p>Targets:</p> <ul style="list-style-type: none"> - 100% beneficial reuse of virgin excavated natural material - 100% recovery of clean concrete for beneficial reuse - 100% recycling of clean reclaimed asphalt pavement - Minimum of 10% cement replacement material (when locally available), measured by mass, used in concrete during construction - Minimum of 10% recycled content (when locally available) by volume in road base and sub base - Prior to disposal of waste or wastewater an assessment of viable reuse or recycling options must be carried out. 	<p>RMS Environmental Sustainability Strategy 2019-2023</p>	<ul style="list-style-type: none"> • Project design limits land disturbance and excavations, minimising waste material, haulage, and resource consumption • Contaminated land assessments and geotechnical investigations influenced design to reduce land disturbance, minimise the impact on the environment, and reduce waste • Wharves designed so that no dredging is required during construction • 50-year design life minimises waste generation and materials required for replacement • Modular design makes it easy to replace infrastructure without using excess materials and generating unnecessary waste • Project has considered opportunities to use prefabricated construction components including precast concrete, piles, berth modular steel work etc. • The project is designed and sized so that construction does not need to rely on imports, and instead could use local products (eg pile diameter limited so that they can be sourced locally). This reduces impacts from transportation emissions and fuel costs and supports local economies • Future provisions for renewable energy integration allowed in current design. This achieves a more efficient construction design and limits the need for re-mobilisation for construction works 	<ul style="list-style-type: none"> • Construction Environmental Management Plan (CEMP) will detail the measures and strategies in place manage waste, meeting community standards and comply with all statutory requirements • The project will comply with the NSW Government Resource Efficiency Policy (GREP) • Where possible, local disposal facilities will be used, limiting waste transport related impacts and risks • Waste management, avoidance and resource recovery will be monitored and tracked during construction. 	<ul style="list-style-type: none"> • The project will comply with the NSW Government Resource Efficiency Policy (GREP).
<p><i>To minimise the use of non-renewable resources and minimise the quantity of waste disposed to landfill.</i></p> <p>Waste management hierarchy:</p> <ul style="list-style-type: none"> • Avoid generating waste • Reduce generating waste • Reuse materials in their original form • Recycle materials into new products • Dispose waste to appropriate landfill 	<p>RMS Technical Guide Sustainability in Infrastructure Design and Construction</p>			

Objectives & initiatives	Policy	Detailed design	Construction	Operation
<p><i>Water management hierarchy;</i></p> <ul style="list-style-type: none"> ○ <i>Avoid using water</i> ○ <i>Reduce the amount of water needed (water efficiency)</i> ○ <i>Reuse water captured onsite</i> ○ <i>Use recycled or other alternative non-potable water sources from offsite</i> 		<ul style="list-style-type: none"> • Robust and hardwearing materials are proposed as a means of limiting maintenance requirements. Particular consideration is made of the harsh outdoor and marine environment • Water use is minimised in landscaping as any new landscaping would indigenous species endemic to the area • Cement replacement products would be used that incorporate recycled materials (eg GGBS and/or fly ash). 		
Pollution control				
<p><i>Minimise noise, water and land pollution from road and maritime construction, operation, and maintenance activities</i></p> <p><i>Targets:</i></p> <ul style="list-style-type: none"> • <i>100% of environmental incidents are reported and tracked in incident reporting systems</i> • <i>100% of Category 1 significant incidents are self-reported</i> • <i>Schedule and complete environmental compliance audits on 100% of sites that incur a formal penalty notice or financial penalty from regulator.</i> 	RMS Environmental Sustainability Strategy 2019-2023	<ul style="list-style-type: none"> • The design limits the introduction of new hardstand to minimise runoff • Drainage system will be improved to minimise the effects of pollution and runoff. 	<ul style="list-style-type: none"> • Construction Environmental Management Plan (CEMP) will detail the measures and strategies in place that limit the impact of pollution during construction (eg noise, dust), meeting community standards and comply with all statutory requirements • Marine vessel management plan stipulates efficient movements of punts, barges etc. used during construction, minimising any unnecessary trips, and avoiding emissions as a result. 	<ul style="list-style-type: none"> • The project will comply with the NSW Government Resource Efficiency Policy (GREP) • Storage of fuel is at a central, controlled location. All vessels will travel to this location for refuelling purpose • Vessel maintenance occurs offsite at a central controlled location.
<i>To minimise noise, land and water pollution from construction, operation, and maintenance activities.</i>	RMS Technical Guide Sustainability in Infrastructure Design and Construction			

Objectives & initiatives	Policy	Detailed design	Construction	Operation
Air quality				
<p><i>Minimise the air quality impacts of road projects and support initiatives that aim to reduce transport-related air emissions.</i></p> <p>Targets:</p> <ul style="list-style-type: none"><i>Projects and operations will identify and apply best practice controls and initiatives for in-tunnel network and ambient air quality</i><i>Construction activities will identify and apply best practice air emissions controls.</i>	RMS Environmental Sustainability Strategy 2019-2023	<ul style="list-style-type: none">The design of the wharves allows for electric ferries in the future which is a pre-emptive step that could reduce air quality impacts of future ferry vesselsDesign has enabled the ability to source materials locally which will reduce transport related air emissionsBicycle parking and designing infrastructure that is cycle friendly encourages this form of transportation reducing reliance on vehicle use.	<ul style="list-style-type: none">Construction Environmental Management Plan (CEMP) will detail emission control measures from construction equipment, vehicles and vesselsThe project is designed and sized so that construction can source local products, reducing transport related air emissions.	<ul style="list-style-type: none">The project will comply with the NSW Government Resource Efficiency Policy (GREP)The operation of electric ferries in the future is possible, reducing operational air emissionsThe project provides a transport link between La Perouse and Kurnell, as an alternative to driving between the two headlands. This may encourage drivers to switch to public transport, therefore reducing reliance on private vehicles, potentially reducing greenhouse gas emissions.
<p><i>To minimise the air quality impacts of road projects and support initiatives that aim to reduce transport related air emissions.</i></p>	RMS Technical Guide Sustainability in Infrastructure Design and Construction			
Biodiversity				
<p><i>Improve outcomes for biodiversity by avoiding, mitigating, or offsetting the potential impacts of road and maritime projects on plants, animals, and their environments</i></p> <p>Targets:</p> <ul style="list-style-type: none"><i>100% of applicable projects will apply the Roads and Maritime Biodiversity Management Guidelines</i><i>All connectivity and mitigation measures will be monitored for effectiveness post implementation.</i>	RMS Environmental Sustainability Strategy 2019-2023	<ul style="list-style-type: none">A Marine Biodiversity Assessment and Terrestrial Biodiversity Development Assessment Report have been carried out as part of the EIS which has influenced design to minimise impacts on biodiversityLocation options were assessed to determine areas of least impact (marine and terrestrial)‘Light touch’ approach to design aimed to reduce impacts on local biodiversityProject is designed so that no dredging is required for constructionNew landscaping would follow the natural slope and would include	<ul style="list-style-type: none">Construction Environmental Management Plan (CEMP) will detail the measures and strategies in place that limit the impact on biodiversity, meeting community standards and comply with all statutory requirementsAppropriate construction boundaries have been identified, including ancillary sites, would be set out to minimise impacts on local vegetationAncillary facilities at Kurnell are located within the Kamay Botany Bay National Park (the National Park) within existing grassed areas, therefore avoiding vegetation clearing or removal requirements.	<ul style="list-style-type: none">A biodiversity offset strategy would be prepared to offset any residual impacts to sensitive seagrass and habitat in the marine environmentMonitoring post construction of the implementation of the biodiversity offsets requirements
<p><i>To improve outcomes for biodiversity by avoiding,</i></p>	RMS Technical Guide			

Objectives & initiatives	Policy	Detailed design	Construction	Operation
<i>minimising, or offsetting the potential impacts of road and maritime projects on plants, animals, and their environments</i>	Sustainability in Infrastructure Design and Construction	<p>indigenous species endemic to the area. Endemic, low lying coastal plants would be selected for the landscape design to integrate with the natural ecosystem of the area</p> <ul style="list-style-type: none"> • Design avoids the need for large areas of vegetation removal • Lighting designed to minimise lighting pollution to the night sky and its effects on the local environment • A biodiversity offset strategy would be prepared to offset any residual impacts to sensitive seagrass and habitat in the marine environment. 	<ul style="list-style-type: none"> • The CEMP will outline measures to avoiding the spread of weeds, pests and diseases. 	
Community benefit				
<p><i>Provide high quality urban design outcomes that contribute to the sustainability and liveability of communities in NSW</i></p> <p><i>Targets:</i></p> <ul style="list-style-type: none"> • <i>Meet the Roads and Maritime Beyond the Pavement policy on all projects</i> • <i>Int the Greater Sydney Region and major regional cities, complete road development projects with no net loss of tree canopy cover.</i> 	RMS Environmental Sustainability Strategy 2019-2023	<ul style="list-style-type: none"> • Chapter 6 (Consultation) outlines the extensive community and stakeholder engagement carried out for project which has informed design to ensure it is fit for purpose and offers community benefits • Plans for cultural interpretation to be incorporated into design (eg artwork, plaques, information storytelling). It is proposed that an Aboriginal artist/designer would be engaged to incorporate cultural narratives into the design of the wharves • The end of each wharf (the berth structure) is designed as a multi-user space with separate berths on each side, one for ferry operations and the other for recreational and commercial boat users. In alignment with the rich fishing history of the Botany Bay headland, the wharves would have adequate spaces to allow for recreational fishing 	<ul style="list-style-type: none"> • Consultation would be ongoing throughout project construction. A Community Liaison Implementation Plan would be prepared prior to construction commencing • The Aboriginal Participation in Construction (APiC) requirements will be met during the construction phase in accordance with the NSW Government Aboriginal Procurement Policy • Procurement of services for marine surveys and monitoring during construction will be considered should the EIS be approved noting the capability and interest from Aboriginal organisations. 	<ul style="list-style-type: none"> • Recognition and engagement with Aboriginal culture as well as the history of French and British arrivals for all visitors would be improved by increasing accessibility to the National Park • The wharves would provide new public transport infrastructure for the community • The wharves would enable a ferry service that allows a connection between La Perouse and Kurnell, improving accessibility to the National Park • Use of active transport would be encouraged through the interconnection with existing and proposed pedestrian and bicycle pathways, as well as the new bicycle parking facilities at La Perouse
<p><i>To provide high quality urban design outcomes that contribute to the liveability of communities in NSW.</i></p> <p><i>Well planned and designed roads and maritime assets can contribute to the liveability of communities in NSW by:</i></p>	RMS Technical Guide Sustainability in Infrastructure Design and Construction			

Objectives & initiatives	Policy	Detailed design	Construction	Operation
<ul style="list-style-type: none"> Contributing to the form and character of our settlements and landscapes Minimising physical separation of communities and help to provide new connections Providing views and an experience of the landscape, waterways, and their history Avoiding and minimising noise, vegetation loss and visual impacts through the route selection process Contributing to the quality of public architecture through the design of roads and bridges Reducing the need for people to travel large distances between residences, employment and recreation through improved integration of land use and transport planning. 		<ul style="list-style-type: none"> The entrance to the wharves from the land integrates and grounds the wharves to the National Park context. It includes seating to foster interactions with the public and allows for a moment of pause in the visitor's journey to the ferry and within the National Park Existing car parking at La Perouse would be reconfigured to provide more car parking spaces and to meet <i>Disability Discrimination Act 1992</i> (DDA) requirements. 		<ul style="list-style-type: none"> New economic opportunities would be created for La Perouse and Kurnell through the reinstatement of the wharves Improved safety for private vehicles users by providing a wharves infrastructure that would enable a safe public transport option Placemaking to enhance the amenity of the area. The wharves would enhance the character of the area, accessibility and makes the space more attractive, comfortable and safe Community will have access to heritage interpretation material on site and via the Transport for NSW website to raise awareness about Aboriginal and Non-Aboriginal heritage associated with the two wharves.
Management and governance systems				
<p><i>Procure goods, services, materials and works for infrastructure development and maintenance projects that over their lifecycle deliver value for money and contribute to the environmental, social, and economic wellbeing of the community</i></p> <p><i>Targets:</i></p> <ul style="list-style-type: none"> All tendered procurement must include non-price selection criteria that assess relevant sustainability and 	RMS Environmental Sustainability Strategy 2019-2023	<ul style="list-style-type: none"> The project is designed and sized so that procurement can rely on local supply chains Design consultants have been pre-qualified where appropriate based on their skills and capability to deliver on sustainability outcomes Contract requirements include mandatory and/or functional requirements to increase potential project sustainability benefits as appropriate. 	<ul style="list-style-type: none"> Mitigation measures detailed in planning approval conditions are reflected in project Construction Environmental Management Plan (or other relevant plans) Implementing the Aboriginal Participation in Construction Policy Where possible, procuring from small and medium-sized enterprises and local businesses including such requirements in procurement strategies and contracts 	<ul style="list-style-type: none"> The project will comply with the NSW Government Resource Efficiency Policy (GREP).

Objectives & initiatives	Policy	Detailed design	Construction	Operation
<p><i>social procurement measures</i></p> <ul style="list-style-type: none"> Do not procure from suppliers known to be applying poor labour practices Where fit for purpose, 100% of timber and timber products will be sourced from sustainably managed forests which have obtained Forest Management Certification. 			<ul style="list-style-type: none"> Ensure assessment criteria, and associated weightings, for tenders include relevant environmental and social responsibility outcomes Including sustainability performance measure in our contracts to increase awareness in our supply chain Supporting local suppliers to minimise haulage distances of construction materials when feasible Systems/requirements are in place to monitor contractor performance and make certain that they deliver on sustainability commitments detailed in their proposals. 	
<p><i>To procure goods and services and construction that over their lifecycle deliver value for money and contribute to the environmental, social, and economic wellbeing of the community.</i></p>	RMS Technical Guide Sustainability in Infrastructure Design and Construction			
Heritage				
<p><i>Maintain and conserve cultural heritage according to its heritage significance and that it contributes positively to awareness of the past</i></p> <p><i>Targets:</i></p> <ul style="list-style-type: none"> All identified heritage assets must be assessed in early project planning stages to allow appropriate consideration of potential impacts and solutions. 	RMS Environmental Sustainability Strategy 2019-2023	<ul style="list-style-type: none"> Heritage places, values and issues have been identified in early project planning and in consultation with the NSW Heritage Council, local communities, local Aboriginal people and other key stakeholders Location of the wharves was considered to avoid known heritage features Location of the wharves acknowledges the old locations of the historic wharf infrastructure 	<ul style="list-style-type: none"> Heritage management plans will be part of CEMP to avoid and mitigate any impacts on known and unknown heritage items. This will include unexpected find procedures should items be discovered during construction. 	<ul style="list-style-type: none"> The project would increase accessibility to heritage sites and increase cultural awareness by providing a new means to access the historical and culturally significance sites Community will have access to heritage interpretation material on site and via the Transport for NSW website to raise awareness about Aboriginal and Non-Aboriginal heritage associated with the two wharves.
<p><i>To ensure cultural heritage is conserved and managed according to its heritage significance and that that it contributes positively to awareness of the past.</i></p>	RMS Technical Guide Sustainability in Infrastructure Design and Construction	<ul style="list-style-type: none"> Land side development is limited to avoid disturbing unknown heritage To maintain and conserve cultural heritage as much as possible, specific Aboriginal community consultation has been carried out 		

Objectives & initiatives	Policy	Detailed design	Construction	Operation
		<p>throughout the project development</p> <ul style="list-style-type: none"> • Consultation with the Aboriginal community has been led by strategic advisor, a respected member of the La Perouse community. The project is also supported by the project communication and community engagement team and an Aboriginal Participation Advisor • Local and cultural identity expression is to be explored through ongoing engagement with the local community and the intent to engage Cultural Interpretation Services to facilitate incorporating cultural interpretation elements • Signage and information plaques would provide directional and cultural information for the National Park • The design of the waiting area and landscape area maintain and frame existing views, particularly heritage views towards historic monuments, artworks, and Aboriginal heritage sites • Existing heritage plaque at Timbery Reserve at La Perouse would be incorporated into landscape design with stakeholder's engagement • Planting palettes and landscape design would reflect the local character and indigenous species endemic to the area thus strengthening local identity. 		

Objectives & initiatives	Policy	Detailed design	Construction	Operation
Training and skills development				
<i>Communicate our sustainability objectives to employees, contractors, and other key stakeholders, and foster a culture which encourages innovative thinking to address sustainability challenges.</i>	RMS Environmental Sustainability Strategy 2019-2023	<ul style="list-style-type: none"> The local indigenous elders conducted site specific cultural heritage training for the project team (design team, environmental consultants, project managers). This session educated the project team about the cultural significance of the area A Climate Change Risk Assessment was undertaken with the project/design team to highlight important environmental and sustainability considerations for the project A Sustainability workshop undertaken with project team to highlight the sustainability objectives and challenges facing the project. 	<ul style="list-style-type: none"> Construction staff will have appropriate training relevant to the site and important site-specific characteristics Comply with the NSW Government Procurement Board Direction Skills, training and diversity in construction Where possible, embed an Apprenticeship target of 20% of the Trades Workforce engaged in carrying out of the Works Consider during procurement the capacity of subcontractors to contribute to skills, training and diversity targets Cultural Awareness Training will be completed prior to commencing work on the site. 	<ul style="list-style-type: none"> Promote the positive environment and sustainability outcomes internally and externally (including challenges and lessons learnt).