

## 23 Sustainability

This chapter assesses the project against the principles of sustainability and provides an overview of how sustainability has been integrated into the project's design.

**Table 23-1** sets out the SEARs relevant to sustainability, alongside the desired performance outcomes of the project, and identifies where the requirements have been addressed in this EIS.

**Table 23-1 SEARs - Sustainability**

SEARs	Where addressed in this EIS
1. The Proponent must assess the sustainability of the project in accordance with the Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability Rating Tool and recommend an appropriate target rating for the project.	Assessment of the sustainability of the project in accordance with the ISCA <i>Infrastructure Sustainability Rating Tool</i> is discussed in <b>section 23.2</b> .
2. The Proponent must assess the project against the current guidelines including targets and strategies to improve Government efficiency in use of water, energy and transport.	Assessment of the project against current guidelines is provided in <b>section 23.1</b> . Sustainable use of water, energy and transport are discussed in <b>sections 23.1 and 23.3</b> .

### 23.1 Overview of sustainability

Sustainable development is referred to as 'development which meets the needs of the present, without compromising the ability of future generations to meet their own needs'<sup>1</sup>. In 2016, 17 Sustainable Development Goals of the United Nations (UN) 2030 Agenda for Sustainable Development officially came into force. These goals encourage all countries to take steps to achieving each of these goals. The project would contribute to the three goals shown below in **Figure 23-1**.



**Figure 23-1 Project relevant Sustainable Development Goals**

The Australian Government refers to ecologically sustainable development as 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'<sup>2</sup>.

The provision of properly functioning infrastructure is essential for sustained economic growth, international competitiveness, public health and overall quality of life<sup>3</sup>. The Infrastructure Sustainability Council of Australia (ISCA) defines sustainable infrastructure as that which is 'designed, constructed and operated to optimise environmental, social and economic outcomes over the long term'<sup>4</sup>.

<sup>1</sup> Brundtland Commission (1987) *Our Common Future*

<sup>2</sup> Australian Government Department of the Environment (1992) *National Strategy for Ecologically Sustainable Development*

<sup>3</sup> Mirza S. (2006) *Durability and sustainability of infrastructure — a state-of-the-art report. Canadian Journal of Civil Engineering*, 33(6): 639–649.

<sup>4</sup> Infrastructure Sustainability Council of Australia (ISCA) (2012) *What is infrastructure sustainability?*

### 23.1.1 Sustainability policy framework

The sustainability policy framework relevant to the project, including NSW Government targets and strategies to improve efficiency in the use of water, energy and transport, is made up of the following documents:

- Future Transport Strategy 2056 (NSW Government 2018)
- A Metropolis of Three Cities – the Greater Sydney Region Plan (Greater Sydney Commission 2018)
- South District Plan (Greater Sydney Commission 2018) and Eastern City District Plan (Greater Sydney Commission 2018)
- Roads and Maritime Environmental Sustainability Strategy 2015–2019 (NSW Roads and Maritime 2016)
- NSW Sustainable Design Guidelines Version 4.0 (Transport for NSW 2017)
- NSW Freight and Ports Strategy (Transport for NSW 2013)
- NSW Climate Change Policy Framework (NSW Office of Environment and Heritage (OEH) November 2016)
- NSW Government Resource Efficiency Policy (OEH 2014)
- NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (NSW Environment Protection Authority (NSW EPA) 2014).

Together, these documents provide the sustainability principles that inform the design of the project. An overview of relevant strategic plans and how the project relates to these plans is provided in **Chapter 4** (Strategic context and project need), **Chapter 5** (Project alternatives and options), **Chapter 21** (Waste management) and **Chapter 22** (Climate change and greenhouse gas). Specific aims and objectives in relation to sustainability for each of the documents are provided below.

### 23.1.2 Future Transport Strategy 2056

The *Future Transport Strategy 2056* is a 40-year vision to use transport to contribute to long-term economic, social and environmental outcomes as well as contribute to the NSW Government's aspirational target to achieve net-zero emissions by 2050.

The Strategy recognises that transport related activities account for just over 40 per cent of NSW's energy consumption with a growing share of total public infrastructure investment. Given this level of energy consumption and subsequent emission of greenhouse gases, transport has a responsibility to operate in a more sustainable way to limit environmental and societal impacts.

While it is recognised that a growing transport investment is critical to the wellbeing of communities, doing so in an unsustainable way risks the government's ability to respond to community needs. As a result, the sixth vision of the Strategy specifically relates to Sustainability including a series objectives including:

- Moving towards sustainability
- Sustainable and equitable transport funding
- Striking the balance between user contributions and taxpayer subsidies
- A continued focus on spending efficiency
- Transport's role in working towards environmental sustainability
- Securing energy reliability and affordability
- Managing a resilient transport system.

### 23.1.3 A Metropolis of Three Cities – the Greater Sydney Region Plan

A *Metropolis of Three Cities* serves as the vision for Sydney where the three cities; Western Parkland, Central River and Eastern Harbour, serve to allow residents to live within 30 minutes of their jobs, education, health facilities and services. This vision aims to utilise land use and transport patterns to boost Sydney’s liveability, productivity and sustainability through a series of Ten Directions.

The Plan sets out a series of objectives to support each of the Ten Directions. Objectives supporting sustainability of relevance to the project and the location they are addressed in the EIS, include:

- Objective 25: The coast and waterways are protected and healthier - **Chapter 18** (Surface water and flooding)
- Objective 27: Biodiversity is protected, urban bushland and remnant vegetation is enhanced - **Chapter 12** (Biodiversity)
- Objective 28: Scenic and cultural landscapes are protected - **Chapter 13** (Landscape and visual) and **Chapter 20** (Aboriginal heritage)
- Objective 31: Public open space is accessible, protected and enhanced - **Chapter 15** (Social and economic)
- Objective 32: The Green Grid links parks, open spaces, bushland and walking and cycling paths - **Chapter 8** (Traffic and transport), **Chapter 15** (Social and economic) and **Appendix C** (Place making and urban design).
- Objective 34: Energy and water flows are captured, used and re-used - **Chapter 17** (Groundwater and geology), **Chapter 18** (Surface water and flooding) and **Chapter 22** (Climate change and greenhouse gas).
- Objective 35: More waste is re-used and recycled to support the development of a circular economy - **Chapter 21** (Waste management)
- Objective 36: People and places adapt to climate change and future shocks and stresses - **Chapter 22** (Climate change and greenhouse gas)
- Objective 37: Exposure to natural and urban hazards is reduced - **Chapter 22** (Climate change and greenhouse gas)
- Objective 38: Heatwaves and extreme heat are managed - **Chapter 22** (Climate change and greenhouse gas).

### 23.1.4 South District Plan and Eastern City District Plan

The *South District Plan* and *Eastern City District Plan* both provide a 20-year action plan to help manage growth and contribute towards achieving the 40 year vision as set out in the Greater Sydney Region Plan. The intent of the plan is to serve as a bridge between regional and local planning.

Specific to Sustainability, the *South District Plan* sets out a series of Planning Priorities to support implementation. The priorities relevant to the project are as follows:

- Planning Priority S1: Protecting and improving the health and enjoyment of the District’s waterways **Chapter 18** (Surface water and flooding)
- Planning Priority S2: Protecting and enhancing bushland, biodiversity and scenic and cultural landscapes and better managing rural areas **Chapter 12** (Biodiversity), **Chapter 13** (Landscape and Visual) and **Chapter 20** (Aboriginal heritage)
- Planning Priority S5: Reducing carbon emissions and managing energy, water and waste efficiently **Chapter 18** (Surface water and flooding), **Chapter 21** (Waste management) and **Chapter 22** (Climate change and greenhouse gas)
- Planning Priority S6: Adapting to the impacts of urban and natural hazards and climate change **Chapter 22** (Climate change and greenhouse gas).

Specific to Sustainability, the *Eastern City District Plan* sets out a series of Planning Priorities to support implementation. The priorities relevant to the project, including where they have been addressed in the EIS are as follows:

- Planning Priority E14: Protecting and improving the health and enjoyment of Sydney Harbour and the District's waterways **Chapter 18** (Surface water and flooding)
- Planning Priority E15: Protecting and enhancing bushland and biodiversity **Chapter 12** (Biodiversity) and **Chapter 20** (Aboriginal heritage)
- Planning Priority E16: Protecting and enhancing scenic and cultural landscapes **Chapter 13** (Landscape and visual)
- Planning Priority E19: Reducing carbon emissions and managing energy, water and waste efficiently **Chapter 18** (Surface water and flooding), **Chapter 21** (Waste management) and **Chapter 22** (Climate change and greenhouse gas)
- Planning Priority E20: Adapting to the impacts of urban and natural hazards and climate change **Chapter 22** (Climate change and greenhouse gas).

### 23.1.5 NSW sustainable Design Guidelines

The *NSW Sustainable Design Guidelines Version 4.0*<sup>5</sup> provide guidance to embed sustainability initiatives into the design and construction of transport infrastructure projects and are aimed at projects being delivered by Transport for NSW, namely rail infrastructure projects.

While these guidelines and the corresponding checklist are not specifically applicable to road projects, the sustainability initiatives outlined in the guidelines are consistent with sustainability objectives identified by Roads and Maritime (see **section 23.1.5**). The compulsory sustainability initiatives identified in the guidelines address the following sustainability themes:

- Energy and greenhouse gases
- Climate resilience
- Materials and waste
- Biodiversity and heritage
- Water
- Pollution control
- Community benefit.

Discussion of how the project would meet each of these themes, in line with the corresponding Roads and Maritime focus areas is provided in **section 23.1.6**.

### 23.1.6 Roads and Maritime Services Environmental Sustainability Strategy

The design has aimed to adopt the approach as outlined in the Roads and Maritime *Environmental Sustainability Strategy 2015-2019*<sup>6</sup>, which outlines nine sustainability focus areas for integrating sustainability into Roads and Maritime operations and services, and aligns with NSW Government targets and strategies as listed in **section 23.1.1**.

**Table 23-2** presents the Roads and Maritime sustainability focus areas and outlines how the project is consistent with these.

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<sup>5</sup> Transport for NSW (2017) *NSW Sustainable Design Guidelines Version 4.0*

<sup>6</sup> Roads and Maritime Services (2016) *Roads and Maritime Environmental Sustainability Strategy 2015–2019*

**Table 23-2 Project consistency with Roads and Maritime sustainability focus areas**

Sustainability focus area	Project consistency
Energy and carbon management	The project's Sustainability Management Plan Outline, identifies initiatives to be implemented during design and construction of the project to reduce carbon emissions, energy use and embodied life cycle impacts. These include minimising travel distances between ancillary facilities and minimising transport of materials and staff around the site, and optimising plant operations and efficiency.
Climate change resilience	A climate change risk assessment has been prepared as part of this EIS to identify risks and adaptation opportunities to improve the project's resilience to future climate change. Refer to <b>Chapter 22</b> (Climate change and greenhouse gas).
Air quality	The project ventilation design ensures that concentrations of air emissions meet NSW, national and international best practice for in-tunnel and ambient air quality are presented in <b>Chapter 9</b> (Air quality).
Resource use and waste management	During construction of the project, unnecessary resource consumption would be avoided by making accurate predictions of the required quantities of resources such as construction materials. The management of construction waste would include reuse and recycling of waste, where possible. Further details are provided in <b>Chapter 21</b> (Waste management).
Pollution control	An acoustic impact assessment has been prepared for the project to identify and mitigate potential noise impacts (refer to <b>Chapter 11</b> (Noise and vibration)). An assessment has also been prepared for the project to identify and mitigate potential air quality impacts (refer to <b>Chapter 9</b> (Air quality)). The EIS includes an assessment of the project's potential impact on soil and groundwater and is provided in <b>Chapter 16</b> (Soils and contamination). The project would also include measures for the abatement, avoidance and/or containment of pollution and waste.
Biodiversity	A biodiversity assessment has been prepared for the project to identify and consider measures to avoid and minimise potential impacts on biodiversity. Project impacts would be managed in accordance with the Roads and Maritime Biodiversity Guidelines. Additional detail is provided in <b>Chapter 12</b> (Biodiversity).
Heritage	Items of non-Aboriginal heritage significance were identified early in the project design and assessment. Impacts on these items have been minimised, avoided and mitigated where practicable and management measures to be implemented throughout construction of the project have been provided. Refer to <b>Chapter 19</b> (Non-Aboriginal heritage). No items of Aboriginal heritage significance were identified however management measures are proposed to reduce the risk of potential impacts on unexpected Aboriginal heritage in <b>Chapter 20</b> (Aboriginal heritage).
Liveable communities	The project would contribute to reducing congestion on the existing road network and improve connectivity across Sydney (refer to <b>Chapter 8</b> (Traffic and transport)). The project would provide and facilitate improvements in pedestrian and cyclist connections, creating new shared cycle and pedestrian pathways and linking existing active transport networks with new connections. The project would also improve the amenity of streetscapes, and would investigate a 'net improvement in public recreation' policy whereby the project results in an overall improvement in terms of public recreation facilities. Additional detail is provided in <b>Chapter 13</b> (Landscape and visual impact assessment) and <b>Chapter 14</b> (Property and land use).
Sustainable procurement	The Sustainability Management Plan Outline guides the implementation of sustainability throughout the project's design and construction phases and facilitates the achievement of the project's ISCA Infrastructure Sustainability (IS) target rating. Refer to <b>section 23.2</b> for discussion of the IS rating scheme and the project's target rating.

### 23.1.7 NSW Freight and Ports Strategy

The *NSW Freight and Ports Strategy*<sup>7</sup> outlines two main objectives: to deliver a freight network that efficiently supports the projected growth of the NSW economy, and to balance freight needs with those of the broader community and the environment.

**Chapter 4** (Strategic context and project need) outlines the potential benefits of the project in improving efficiency of the freight network.

### 23.1.8 NSW Climate Change Policy Framework

The *NSW Climate Change Policy Framework*<sup>8</sup> aims to maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate. The framework outlines policy directions for implementing the government's long-term objectives of achieving net zero emissions by 2050, and improving the resilience of NSW to a changing climate.

As part of the implementation of this framework, two additional draft plans have been released for public consultation:

- *Climate Change Fund Draft Strategic Plan 2017–2022*<sup>9</sup>
- *A Draft Plan to Save NSW Energy and Money*<sup>10</sup>.

The *Draft Climate Change Fund Strategic Plan 2017–2022* sets out priority investment areas for funding over the next five years, including the provision of up to \$100 million in new funding for actions to prepare NSW for a changing climate. As part of this priority investment area, the draft plan identifies actions for reducing the costs to public and private assets arising from climate change; reducing the impacts of climate change on health and wellbeing, particularly for vulnerable communities; and managing the impacts of climate change on natural resources, natural ecosystems and communities.

**Chapter 22** (Climate change and greenhouse gas) identifies climate change risks to the project and the adaptation measures implemented during design to improve the resilience of the project to climate change.

The *Draft Plan to Save NSW Energy and Money* is proposed to meet the NSW Government's energy efficiency target of 16,000 gigawatt hours of annual energy savings by 2020, and contribute to achieving net zero emissions by 2050. The draft plan summarises the preferred options for achieving the state's energy savings target, which include opportunities for implementing energy standards for State significant developments and major infrastructure projects such as road tunnels. **Chapter 22** (Climate change and greenhouse gas) and **Chapter 21** (Waste management) outline the proposed energy efficiency measures to reduce the project's energy consumption and contribution to greenhouse gas emissions.

### 23.1.9 NSW Government Resource Efficiency Policy

The *NSW Government Resource Efficiency Policy*<sup>11</sup> aims to drive resource efficiency, with a focus on energy, water and waste, and a reduction in harmful air emissions. The policy aims to ensure NSW Government agencies show leadership by incorporating resource efficiency in decision-making.

The policy includes specific measures, targets and minimum standards to drive resource efficiency. Refer to **Chapter 22** (Climate change and greenhouse gas) and **Chapter 21** (Waste management) for information regarding how the project aligns with the policy.

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<sup>7</sup> Transport for NSW (2013) *NSW Freight and Ports Strategy*

<sup>8</sup> OEH (2016) *NSW Climate Change Policy Framework*

<sup>9</sup> OEH (2016) *Climate Change Fund Draft Strategic Plan 2017-2022*

<sup>10</sup> OEH (2016) *A Draft Plan to Save NSW Energy and Money*

<sup>11</sup> NSW Government (2014) *NSW Government Resource Efficiency Policy*

### 23.1.10 NSW Waste Avoidance and Resource Recovery Strategy 2014-21

The *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*<sup>12</sup> provides a framework for waste management.

The *NSW Waste Avoidance and Resource Recovery Strategy 2014-21* includes the following six key result areas: avoid and reduce waste generation; increase recycling; divert more waste from landfill; manage problem wastes better (including asbestos); reduce litter; and reduce illegal dumping.

In line with the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*, measures to avoid, minimise or manage waste streams generated as a result of the project are detailed in **Chapter 21** (Waste management). The management of contaminated waste, including contaminated spoil is discussed in **Chapter 16** (Soils and contamination) and **Chapter 21** (Waste management), along with mitigation measures, including the ways in which disposal of contaminated waste would be managed.

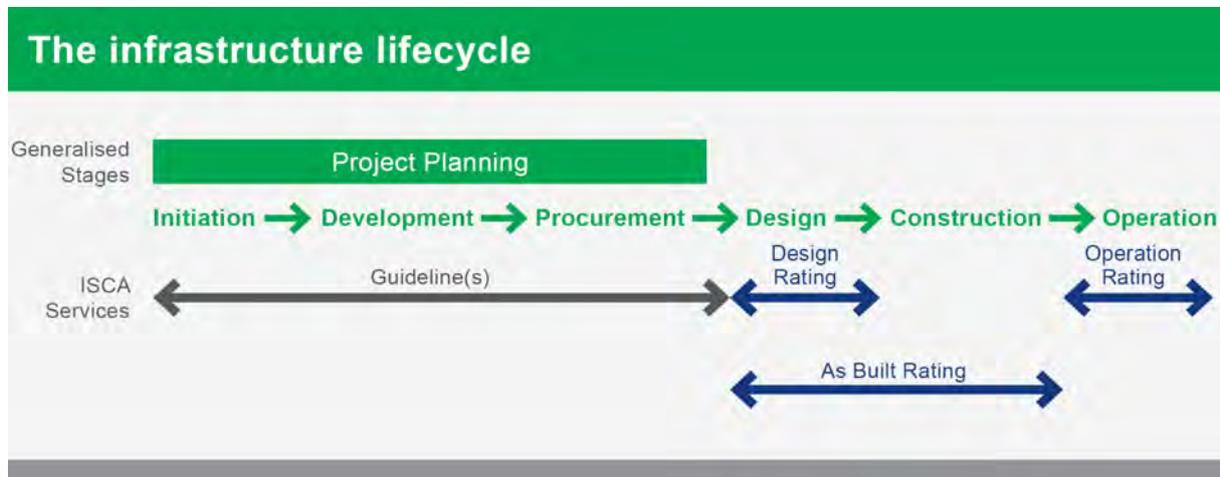
## 23.2 Infrastructure Sustainability Rating Scheme

Sustainability of the project will be assessed in accordance with the ISCA Rating Tool to determine and set an appropriate target rating for the project, in accordance with the SEARs.

In August 2018, ISCA released the new Planning, Design and As-Built Infrastructure Sustainability (IS) Version 2.0 ratings. This update provides a number of improved and additional categories and credits to further enhance the sustainability performance of major infrastructure projects. Roads and Maritime have registered for Design and As-Built IS Version 1.2 for the project prior to the release of Version 2.0. Therefore, Version 1.2 would continue to be used for the remainder of the project and options to selectively apply Version 2.0 criteria would be considered where beneficial to achieving sustainable project outcomes.

The IS rating scheme was developed and is administered by ISCA. The IS rating scheme is a comprehensive rating system for evaluating sustainability across the design, construction and operation of infrastructure, as shown in **Figure 23-2**. For Version 1.2 the three types of ratings as part of the IS rating scheme are Design, As Built and Operation.

The project is seeking a minimum IS ‘Design’ and ‘As-Built’ rating of ‘Excellent’.



**Figure 23-2 IS rating scheme and the project’s target rating**

<sup>12</sup> NSW Government (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*

Sustainability workshops and meetings were held during EIS development with planning and design teams to assess and progress initiatives for achieving the target IS 'Design' and 'As-Built' rating criteria. Opportunities for future detailed design developments suggested in these workshops were also taken into account.

Sustainability initiatives were identified under the following headings:

- Energy and water, including initiatives for achieving efficiencies in energy and water use through design of tunnel ventilation, stormwater drainage and utilities
- The reduction of waste, including the reuse of construction ancillary facilities used for the New M5 at Arncliffe, as well as the management and reuse of spoil during construction
- Access and movement, including provision for shared cycle and pedestrian pathways for improved connectivity along the Rockdale Wetlands and Recreation Corridor
- Natural landscape and environment, including initiatives to minimise the construction boundary, where possible, and protect ecologically sensitive areas including the wetlands near the President Avenue interchange
- Adaptation to climate change, including initiatives to improve the resilience of the project to future extreme climate events and sea level rise
- Cultural heritage and identity, including initiatives for the preservation of heritage values.

A number of actions were documented for planning and design consideration to embed specific sustainability commitments and targets for implementation by the construction contractor. The construction contractor would be responsible for ensuring that enough credits are achieved to meet the IS 'Excellent' rating.

A project specific Sustainability Management Plan Outline would be prepared to guide the implementation of sustainability throughout the design and construction phases and to facilitate the achievement of the IS rating.

### 23.3 Ecologically sustainable development

Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends is referred to as ecologically sustainable development. The principles of ecologically sustainable development have been considered throughout the development of the project.

One of the objectives of the Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act) is to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment. The SEARs for the project require the project to have regard to ecologically sustainable development. The *Protection of the Environment Administration Act 1991* notes that ecologically sustainable development can be achieved through the implementation of the following principles and programs:

- The precautionary principle
- Inter-generational equity
- Conservation of biological diversity and ecological integrity
- Improved valuation and pricing and incentive mechanisms.

These principles are discussed below in the context of the project and the environmental planning and assessment process.

### 23.3.1 Precautionary principle

The precautionary principle deals with certainty in decision making, whereby lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The precautionary principle has been applied during the design and development of the project. Potential environmental impacts associated with the project were considered during the alternatives and options analysis, as discussed in **Chapter 5** (Project alternatives and options).

This EIS details the evaluation of environmental impacts associated with the project. The EIS was prepared adopting a conservative approach, which included assessing the worst case impacts and scenarios. It has been undertaken using the best available technical information and has adopted best practice environmental standards, goals and measures to minimise environmental risks. The environmental assessment has been undertaken in collaboration with key stakeholders and relevant statutory and agency requirements.

Potential environmental risks associated with the project were identified and considered to ensure that an appropriate amount of time was afforded for detailed specialist reports as part of the environmental assessment. Refer to the environmental risk analysis undertaken for **Chapter 8** (Traffic and transport) to **Chapter 21** (Waste management). Safeguards and management measures have been developed to manage impacts identified in these assessments. The safeguards and management measures would result in an acceptable residual risk and no significant serious or irreversible environmental harm.

As discussed in **section 23.2**, sustainability workshops and meetings were held during EIS development with planning and design teams, which sought to preserve opportunities for the implementation of sustainability initiatives in future detailed design development.

### 23.3.2 Inter-generational equity

Inter-generational equity refers to the premise that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

The project tunnels would have a design life of about 100 years and would be designed to meet the needs of both current and future generations. The project has been considered in terms of intergenerational equity, with the management of potential environmental impacts discussed throughout this EIS.

The project may impact on inter-generational equity through the consumption of fuel resources during construction and operation, contributing to the decline of available fuel resources. Roads and Maritime note that it is prudent to consider that oil production may peak and then decline which could increase the cost and reduce the availability of transport fuels and construction materials derived from oil, such as bitumen. For transport, the solutions to the problem of 'peak oil' are similar to those for climate change. Alternatives to fossil fuels need to be found and transport must become more energy efficient. There are moves to establish alternatives to oil as a fuel for transport and to improve energy efficiency. This would enable the economic benefits provided by road transport to continue to be delivered with a reduced need for fossil fuels.

Roads and Maritime is also participating with Austroads and industry in research and trials with the goal of developing more practices to reduce reliance on products derived from oil. As road transport is a significant and necessary element of the NSW economy, that also provides many social benefits, Roads and Maritime will continue to ensure that all potential impacts on this system, such as peak oil, are identified and action is taken to manage these risks.

In accordance with the project objectives to improve travel times between southern Sydney and strategic centres in the metropolitan area, increases in average speeds as a result of the operational efficiency of the project tunnels, which would reduce the number of intersections and the frequency of stopping, would result in improved vehicle fuel efficiency.

The project's resilience to future climate change is considered in **Chapter 22** (Climate change and greenhouse gas), which identifies potential climate risks to the project, adaptation incorporated in the project's design development and recommended next steps for the development of adaptation options during detailed design. The project would contribute to building the resilience of metropolitan Sydney by addressing some of the key chronic stresses facing the city, including the need for improved connectivity and reduced congestion.

Under expected traffic conditions the contribution of project tunnel ventilation outlets to pollutant concentrations was found to be negligible for all sensitive receptors identified. Exceedances of some air quality criteria were predicted to occur at a small proportion of sensitive receptors both with and without the project however are expected to be dominated by background concentrations and not as a result of the ventilation outlets. The total number of receptors with exceedances decreased slightly with the project and in the cumulative scenarios. Refer to **Chapter 9** (Air quality) and **Appendix E** (Air quality technical report) for additional detail.

### 23.3.3 Conservation of biological diversity and ecological integrity

Conservation of biological diversity and ecological integrity is a fundamental consideration of the project. The design and assessment of the project has been undertaken with the aim of identifying, avoiding, minimising and mitigating impacts.

The project has substantially avoided biodiversity impacts by utilising, as much as possible, already disturbed sites and due to most of the infrastructure being underground. The proposed tunnels are distant from potentially sensitive wetlands. This minimises the potential indirect impacts on migratory bird habitat at the Cooks River and Rockdale wetlands.

Further avoidance of impacts include relocation of a proposed water treatment plant to the already cleared area at the Arncliffe Construction ancillary facility (C1), generating fewer impacts than would be expected from using an undeveloped site. This would include reduction in construction noise, vibration dust and light spill. The following Plant Community Types require offsetting in accordance with the online credit calculator: about 0.47 hectares of 1232 Swamp Oak floodplain swamp forest, about 0.30 hectares of 1795 Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest, and about 0.77 hectares of 1808 Common Reed.

The project would remove about 4.45 hectares of potential foraging habitat for the Grey-headed Flying-fox. While the habitat likely to be impacted is potential foraging habitat, the small area of habitat and its relatively urban context would not present a barrier to movement or breeding for this species. Grey-headed Flying-fox forage across a wide range of vegetation, including two camps within 10 kilometres of the project.

The project is likely to indirectly impact on Green and Golden Bell Frog habitat during construction, particularly at the Marsh Street Green and Golden Bell Frog habitat site. Impacts would include disturbance due to noise, dust and vibration arising from the continued use of the Arncliffe construction ancillary facility. The potential indirect impacts are not expected to be significant and would cease at the completion of construction. These indirect impacts would also likely be less than those arising from the New M5 project, as the project would use already constructed facilities, reducing the overall construction noise, movement of vehicles, light, dust and vibration (refer to **Chapter 12** (Biodiversity)).

Fauna injury or mortality could occur during construction of the project, as a result of direct collision with vehicles and equipment within the project footprint. Mobile species (such as birds) may be able to move away quickly and easily, but other less mobile species, or those with high fidelity with their home range, may be slower to move away or may not relocate at all, potentially resulting in injury or mortality of the individual. Although there is potential for some injury or mortality of fauna species, the project is unlikely to result in a large number of fauna injury or mortality incidents, as the majority of the project would be constructed underground. Where temporary and permanent ancillary facilities and infrastructure occur, the surrounding land is highly urbanised. Implementation of management measures outlined in **Chapter 12** (Biodiversity) would reduce the chances of injury or mortality of fauna. Measures to manage potential impacts on bats would be included in the Construction Flora and Fauna Management Plan.

A number of mitigation measures to minimise ecological direct and indirect impacts would be implemented as part of the project in line with Roads and Maritime *Biodiversity Guidelines – Protecting and managing biodiversity on RTA projects*. These measures would be detailed in the flora and fauna management plan for the project which includes: site-specific environmental induction; identification of clearing limits and protective fencing; vegetation clearance procedures; pre-clearance surveys; erosion and sediment controls; weed management and monitoring.

This EIS provides a detailed assessment of potential impacts on biodiversity and identifies a range of mitigation measures to further avoid and minimise potential impacts. Refer to **Chapter 12** (Biodiversity) and **Appendix H** (Biodiversity development assessment report) for additional detail.

### 23.3.4 Improved valuation and pricing and incentive mechanisms

The principle of improved valuation and pricing and incentive mechanisms relates to the consideration of environmental factors in the valuation of assets and services. Environmental factors include:

- Polluter pays (i.e. those who generate pollution and waste should bear the cost of containment, avoidance or abatement)
- The users of goods and services should pay prices based on the full life cycle of costs of providing the goods
- Environmental goals, having been established, should be pursued in the most cost-effective ways.

Environmental factors have been considered throughout the concept design stage for the design, construction and operation of the project. As a consequence, environmental impacts have been avoided or minimised where practical during the concept design development for the project.

Mitigation measures outlined in this EIS will be implemented during construction and operation of the project. These mitigation measures would be revised and updated as required during the detailed design stage of the project and as the project passes through the assessment process.

The value placed on avoiding and minimising environmental impacts is demonstrated in the design features incorporated into the project, including opportunities for reducing emissions through efficient design, for reducing overall waste and properly handling any contaminated waste, for minimising noise through adoption of integrated noise reduction measures, for protecting biodiversity by assessing and managing impacts on habitat and connectivity, and for ensuring sustainability in procurement through procurement of appropriate skills and maximising enforceability of sustainability contract requirements. The cost of these mitigation measures are incorporated into the project cost, as well as the extent of environmental investigations undertaken to inform this EIS.

This project creates the potential for improvements in local amenity with the shared cycle and pedestrian pathways and return of the majority of parklands used for construction facilities restored to park uses and revegetated. The project would also provide improvements to pedestrian and cyclist connections, linking existing active transport networks with new connections or improving existing connections through a reduction in traffic, which would improve the amenity of streetscapes. Land use impacts are detailed in **Chapter 14** (Land use and property). **Appendix C** (Place making and urban design) contains specific guidance on design of a cohesive identity and high quality user experience for the project.

## 23.4 Management of impacts

The overarching sustainability objectives for the project would be met through the implementation of a Sustainability Management Plan and project specific sustainability initiatives. The implementation of these initiatives would contribute to the project achieving an IS rating of 'Excellent'.

### 23.4.1 Sustainability management plan

The detailed design would include development and implementation of a detailed Sustainability Management Plan (SMP). The Sustainability Management Plan would establish governance structures, processes and systems that ensure integration of all sustainability considerations (vision, commitments, principles, objectives and targets), initiatives, monitoring and reporting during the detailed design and construction phases of the project.

The aims of the Sustainability Management Plan would be to:

- Demonstrate sustainability leadership and continuous improvement
- Protect and enhance the natural environment and local heritage
- Contribute to liveable communities and facilitate urban revitalisation by easing congestion, connecting communities and integrating land use and transport planning
- Optimise resource efficiency (materials, energy, water and land) and waste management
- Increase resilience to future climate
- Design for future transport needs
- Procure sustainably, considering whole of life environmental, social and economic factors
- Maximise equitable/fair training and employment opportunities.

Principles in the Sustainability Management Plan would extend across the project's detailed design, construction and operation phases. These principles would also be embedded across all management disciplines throughout detailed design and the construction contractor's project team, ensuring that decision making processes consider environmental, social and economic costs and benefits over the life of the project.

The Sustainability Management Plan would form part of the integrated management system to be implemented on the project. The plan would be revised and updated regularly to reflect changing designs and sustainability initiatives through each of the project phases.

The Sustainability Management Plan would include an ISCA IS Rating Management sub-plan to guide the achievement of an IS rating of 'Excellent' for the project. The sub-plan would detail implementation protocols, including:

- ISCA IS assessment and registration process and timeframes
- Proposed consultation and engagement with ISCA and other stakeholders
- The IS rating process and requirements for the provision of documentation to ISCA
- Key sustainability management roles and responsibilities.