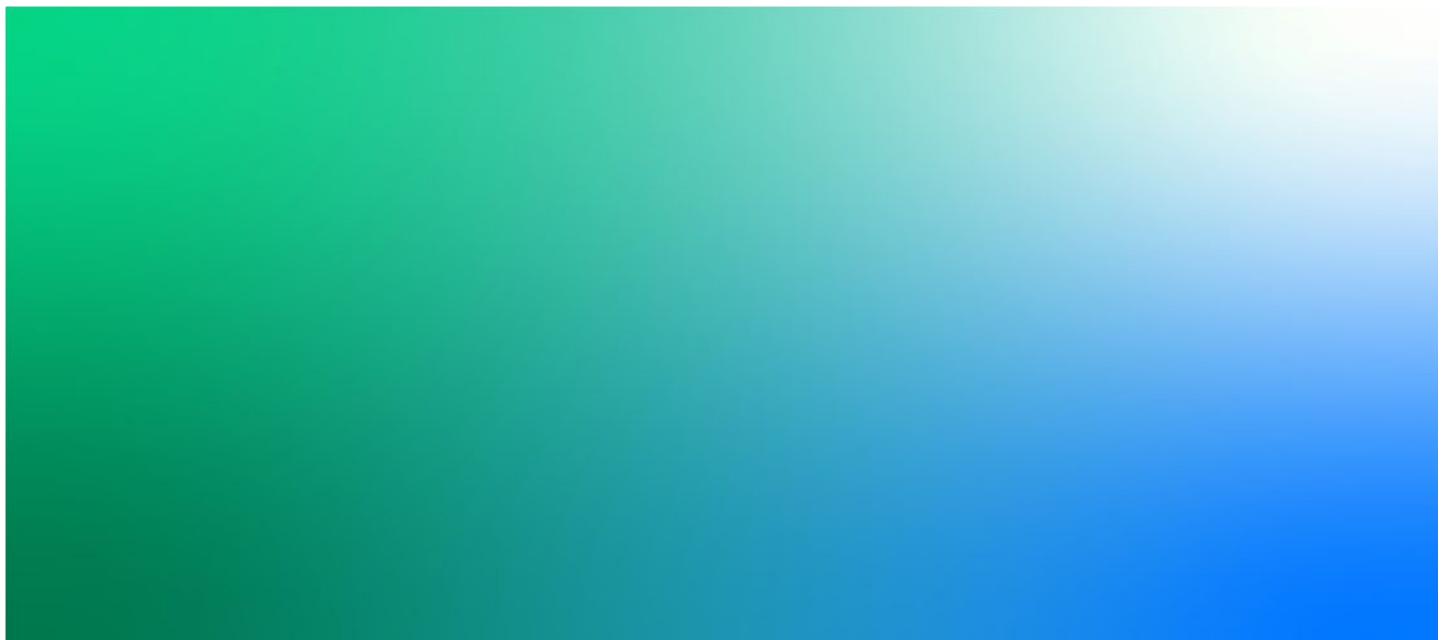


Jacobs

Hexham Straight Widening Sustainability Assessment

IA301100-HSW-EN-RPT-0018 | 04
07 October 2021

Transport for NSW
19.0000303652.1031



Executive summary

Background

Transport for NSW (Transport) is proposing to widen a six kilometre section of the Pacific Highway (Maitland Road) from four lanes to six lanes, starting about 290 metres south of the intersection with the Newcastle Inner City Bypass at Sandgate, and extending through to about 760 metres north of Hexham Bridge, in Hexham, NSW (the proposal). The proposal would create two additional lanes, one in each direction and would include the replacement of the twin bridges at Ironbark Creek. The section of road is known as the 'Hexham Straight' and is located within the City of Newcastle local government area (LGA), with a small portion of the construction area on the eastern side of the Hunter River within the Port Stephens Council LGA.

Maitland Road is a critical link as part of the National Land Transport Network and is among the busiest transport corridors carrying some of the highest traffic volumes in the Hunter. The proposal is required to reduce congestion and improve safety along Maitland Road.

The proposal is subject to assessment under two planning pathways, a review of environmental factors (REF) under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and an environmental impact statement (EIS) under Part 4 of the EP&A Act. The majority of the proposal (the REF area) is subject to approval under Division 5.1 of the EP&A Act that would be determined through a REF by Transport. However, a small part of the proposal (3.28 hectares) is within land mapped as 'Coastal Wetlands' under State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP). As such, that part of the proposal (known as the EIS areas) is subject to approval under Part 4 of the EP&A Act and will be assessed within an EIS.

Purpose

The purpose of this report is to assess the potential impacts to sustainability from constructing and operating the proposal. This report supports both the REF and the EIS.

The Roads and Maritime Services *Environmental Sustainability Strategy 2019-2023* (2019) (Environment Sustainability Strategy) has been used as the guiding framework to undertake the assessment given its relevance to the project.

Overview of sustainability impacts in the REF area

A review of the proposal against the sustainability focus area objectives of the *Environmental Sustainability Strategy* indicates that the REF area of the proposal is aligned with the strategy's sustainability objectives. This is achieved through the development of environmental management measures identified in this assessment and the proposal's other specialist assessments. The proposal also has either already satisfied Transport's proposal relevant compulsory sustainability requirements through the development of the proposal design or are placed to do so through detailed design and construction.

Through alignment with the *Environmental Sustainability Strategy* and with Transport's *Environment and Sustainability Policy*, the construction of the proposal is seeking to promote efficient use of natural resources where feasible and avoid waste spoil on the proposal in accordance with the desired performance outcomes. The proposal's sustainability performance would be coordinated through the development and application of a Sustainability Management Plan.

Overview of sustainability impacts in the EIS area

Sustainability objectives relevant to the proposal largely relate to the larger REF area but relevant compulsory sustainability requirements have been incorporated into proposal elements in the smaller EIS area during the development of the design or would be incorporated during detailed design and construction. Sustainability impacts associated with the EIS area are anticipated to be minor.

Management measures

Sustainability focus areas are supported by the management measures identified across the specialist assessments completed for the proposal, in particular those associated with climate change risk, surface water and ground water assessments and soil and contamination assessment. In addition to these measures, specific sustainability measures have been proposed to support the achievement of sustainable outcomes in the proposal through detailed design and during construction.

Management measures focus on opportunities to coordinate proposal efforts toward sustainability during detailed design and construction by incorporating sustainability outcomes across efficient resource use, minimising environmental impacts through design and construction optimisation, sustainable procurement and developing the proposal to leave a positive legacy for the local community.

Prior to construction, tender documentation would detail the proposal's sustainability requirements for the contractor, including the development of a sustainability management plan to guide the delivery of sustainability outcomes on the proposal. Other plans which would help deliver the sustainability performance outcomes include the Sustainable Procurement Management Plan, and inclusions in the Construction Environmental Management Plan.

In delivery, the management measures will focus on management of sustainability during construction, including resource efficiency, sustainable procurement, and employment and training. The management measures will require that the contractor monitors and reports on its performance to Transport to ensure that Transport's sustainability objectives are achieved.

Conclusion

This document has been developed following the guidance of the *Environmental Sustainability Strategy*, and Transport's *Environment and Sustainability Policy* throughout design. Through adherence to the sustainability approach outlined in this document and the environmental management measures developed for sustainability and related disciplines the development of a comprehensive Sustainability Management Plan, the proposal would satisfy the desired performance outcomes relating to Transport's sustainability objectives.

Contents

1. Introduction.....	1
1.1 Proposal overview.....	1
1.1.1 The proposal.....	1
1.1.2 The EIS area.....	5
1.1.3 The REF area	5
1.1.4 Relationship of the REF and EIS	5
1.1.5 Location	7
1.2 Purpose and scope of the report	7
1.3 Terms and definitions	7
1.4 Sustainability objectives.....	8
2. Legislative framework.....	9
2.1 NSW legislation.....	9
2.1.1 Environmental Planning and Assessment Act 1979	9
2.1.2 Transport Administration Act 1988 (NSW)	9
2.1.3 Waste Avoidance and Resource Recovery Act 2001	9
2.1.4 Modern Slavery Act 2018.....	9
2.2 Relevant policies, guidelines and strategies	10
2.2.1 Roads and Maritime Services Environmental Sustainability Strategy 2019-2023 (2019).....	10
2.2.2 Transport Environment and Sustainability Policy Framework and Statement.....	11
2.2.3 NSW Government Resource Efficiency Policy.....	11
2.2.4 NSW Future Transport Strategy 2056	12
2.2.5 Beyond the Pavement.....	12
2.2.6 NSW Government Procurement Policy Framework.....	12
2.2.7 Small to Medium Enterprise and Regional Procurement Policy	13
2.2.8 Transport's Social Procurement Workforce Development Resource Guide	13
2.2.9 NSW Aboriginal Procurement Policy.....	13
2.2.10 United Nations Sustainable Development Goals	14
2.2.11 NSW Circular Economy Policy.....	14
2.2.12 NSW Net Zero Plan Stage 1 2020-2030	15
3. Methodology for the assessment	16
4. Assessment of the proposal.....	18
4.1 Overview	18
4.2 Environmental Sustainability Strategy	18
5. Environmental management measures	27
6. Conclusion	29
6.1 Overview of sustainability impacts in the REF area	29
6.2 Overview of sustainability impacts in the EIS area.....	29
6.3 Proposal summary.....	29

7.	References	30
8.	Acronyms	32

Tables

Table 3.1 Sustainability focus areas, objectives and specialist assessments.....	16
Table 4.1 Sustainability focus areas that relate to key environmental constraint for the proposal.....	19
Table 5.1 Environmental management measures	27

Figures

Figure 1.1 Proposal local area.....	3
Figure 1.2 The proposal.....	4
Figure 1.3 The EIS area and REF area.....	6
Figure 2.1 Environmental Sustainability Strategy context	10

Limitations

The sole purpose of this report and the associated services performed by Jacobs was to provide an assessment of sustainability in accordance with the scope of services set out in the contract between Jacobs and Transport for NSW (the Client). That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from other specialist reports, the public domain and the Client (if any). The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the proposal and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of, Jacobs' Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

1.1 Proposal overview

Transport for NSW (Transport) is proposing to widen about six kilometres of the Pacific Highway (Maitland Road) from four lanes to six lanes, starting about 290 metres south of the intersection with the Newcastle Inner City Bypass at Sandgate, and extending through to about 760 metres north of Hexham Bridge, in Hexham, NSW (the proposal). The proposal would create two additional lanes, one in each direction and would include the replacement of the twin bridges at Ironbark Creek. The section of road is known as the 'Hexham Straight' and is located within the City of Newcastle local government area (LGA) with a small portion of the construction area within the Port Stephens Council LGA (refer to **Figure 1.1**).

Maitland Road is a critical link as part of the National Land Transport Network and is among the busiest transport corridors carrying some of the highest traffic volumes in the Hunter. The proposal is required to reduce congestion and improve safety along Maitland Road during peak travel times.

The proposal is subject to assessment under two planning pathways, a review of environmental factors (REF) under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and an environmental impact statement (EIS) under Part 4 of the EP&A Act. The majority of the proposal (the REF area) is subject to approval under Division 5.1 of the EP&A Act that would be determined through a REF by Transport. However, a small part of the proposal (3.28 hectares) is within land mapped as 'Coastal Wetlands' under State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP). As such, that part of the proposal (known as the EIS areas) is subject to approval under Part 4 of the EP&A Act and considered within the EIS.

This report has been prepared to support both the REF, the EIS and to assess the impacts of the proposal on sustainability.

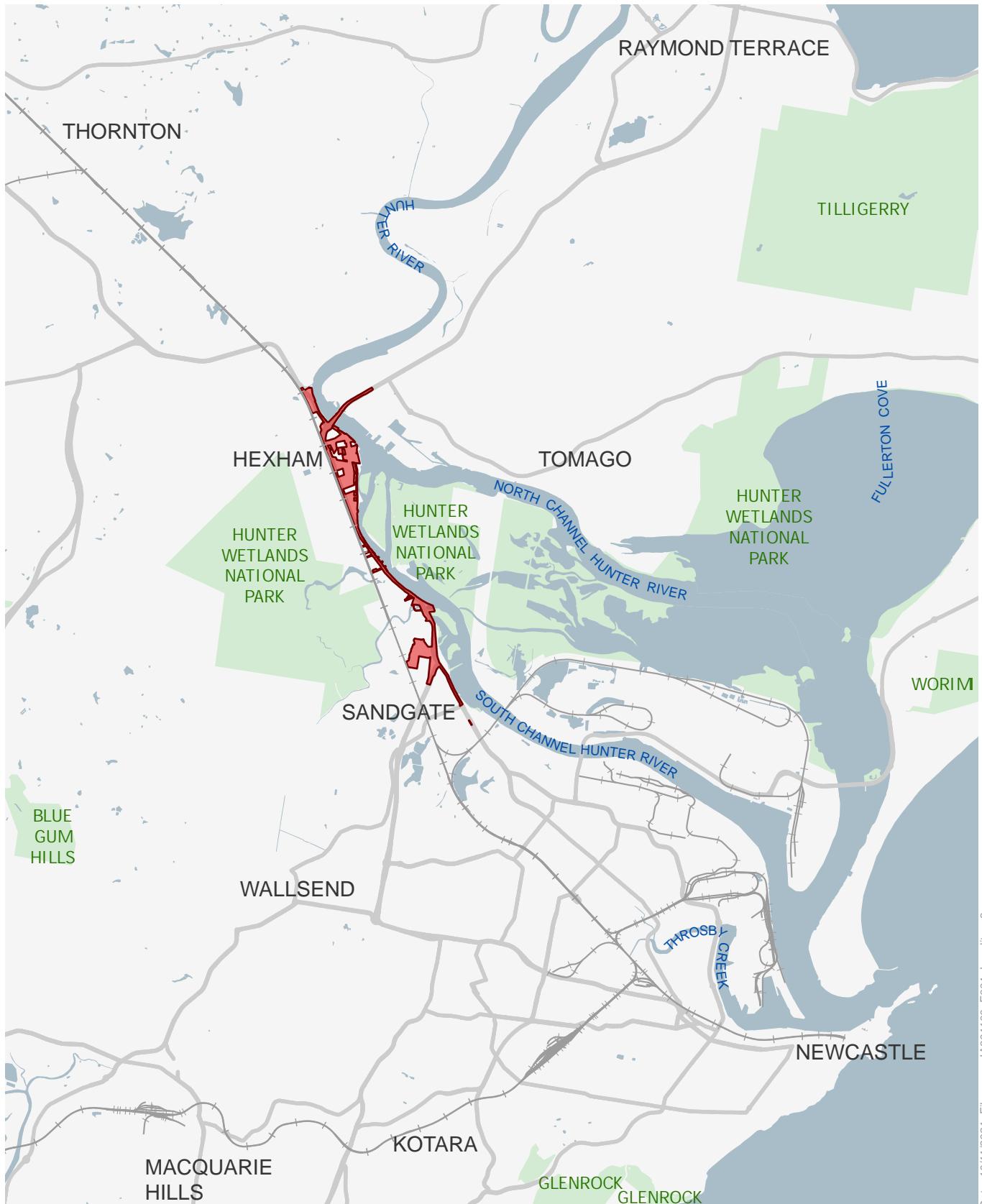
1.1.1 The proposal

The proposal consists of:

- Widening of Maitland Road for about six kilometres starting about 290 metres to the south of the intersection with the Newcastle Inner City Bypass (A37) at Sandgate and extending to about 760 metres north of Hexham Bridge at Hexham on Maitland Road. The highway would be widened from generally two lanes in each direction to three lanes in each direction
- Replacement of the bridge which spans Ironbark Creek with new twin bridges. The existing bridge and all piers would be demolished, and the outlet of a small drainage channel would be relocated about 10 metres to the east of its existing location
- Minor improvements to nine signalised intersections
- Minor improvements to access roads, unsignalised intersections, entry and exit ramps connecting to the A1 Pacific Highway and the U-turn facility at the northern end of the proposal
- Closure of breaks in the existing median and direct access to two local side roads, one private access road and one U-turn facility
- Provision for a three metre wide shared use path northbound between the Oak Factory and the northern end of the proposal and a new section of off-road shared use path heading east along the Newcastle Inner City Bypass
- Widening of existing footpaths at intersection and bus stops
- Adjustments to property accesses and bus stops
- Provision of U-turn facilities on Sparke Street, Shamrock Street, and Old Maitland Road at Hexham

- Relocation of utilities including power, communications, water, gas and wastewater services
- Modifications and maintenance of existing drainage structures including pits, pipes, headwalls and culverts to suit the road widening and to maintain capacity
- Construction of retaining walls to minimise impacts on nearby properties
- Property acquisition, leases and adjustments
- Construction of hardstand for oversize and overmass (OSOM) vehicle parking at the southern and northern end of the proposal
- Intrusive investigation works such as geotechnical investigations
- Temporary construction facilities, including site compounds and stockpile sites at:
 - One area located in the industrial estate located on Old Maitland Road, Sandgate to the south of Calvary St Joseph's Retirement Community (Compound 1)
 - Two areas located in the industrial estate located to the east of Maitland Road and the west of Old Maitland Road, Hexham extending north from the northern boundary of the Hexham sports field to the area of road corridor underneath the entry ramps to the A1 Pacific Highway and Hexham Bridge (Compound 2)
 - Two areas located in the industrial estate located to the west of Maitland Road, Hexham near the Oak Factory (Compound 3)
 - One area located on vacant land to the east of the U-turn facility at the northern end of the proposal on Maitland Road, Hexham to the west of the main channel of the Hunter River (Compound 4).

An overview of the proposal is shown in **Figure 1.2**. Construction of the proposal would be staged and would take about 30 months to construct.



Legend

- Construction area
- National Park
- Waterway
- Railway
- Road

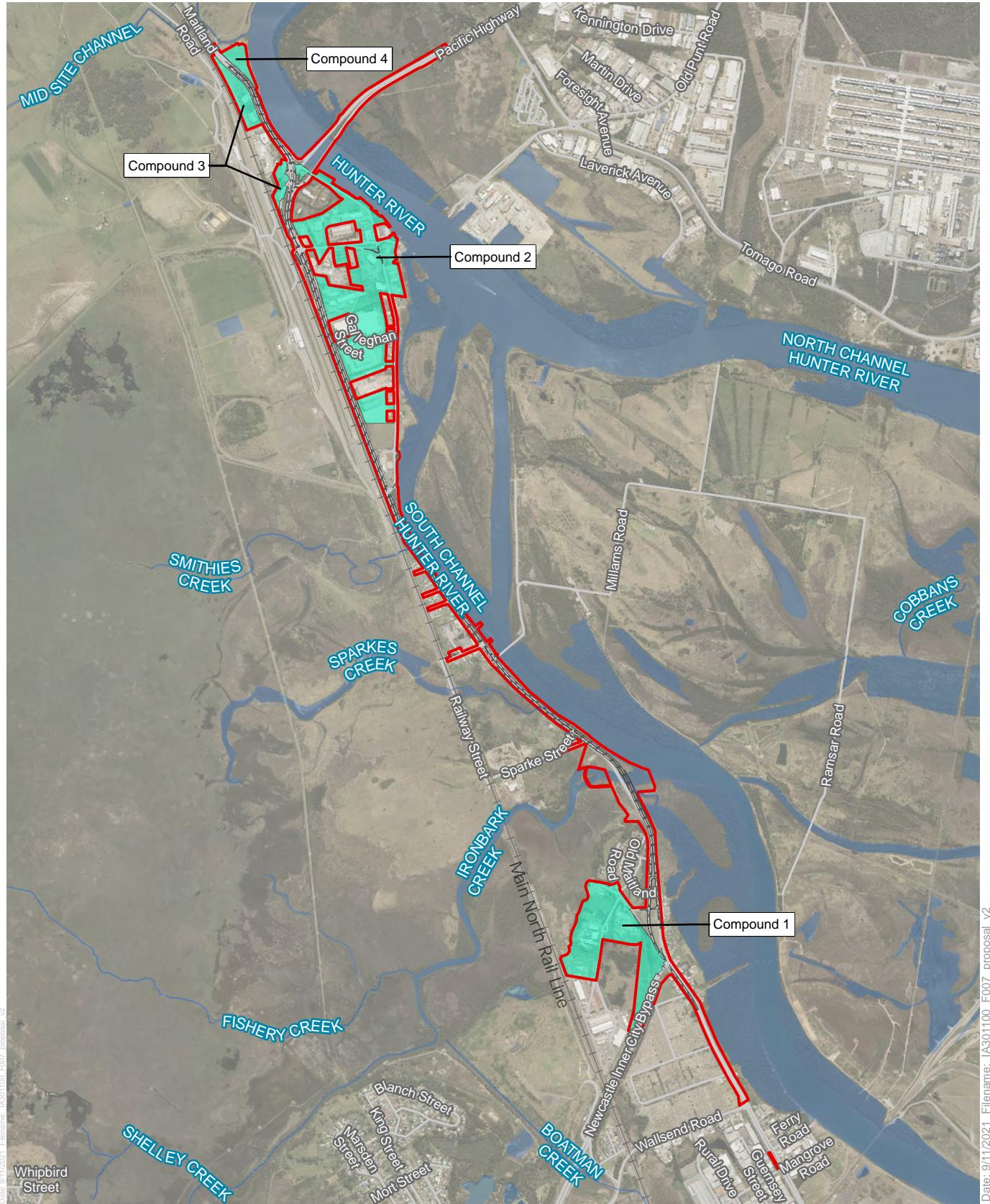
0 1 2 km
Scale 1:100,000 at A4
GDA94 MGA56

Data sources:

Jacobs 2020
Department Finance,
Services and Innovation 2020

Figure 1.1 Proposal local area

Hexham Straight Widening



Legend

- The proposal
- Construction area
- Construction compound
- Waterway
- Road
- Railway

0 200 400 m
Scale 1:30,000 at A4
GDA94 MGA56

Data sources:
Jacobs 2020
Department Finance,
Services and Innovation 2020

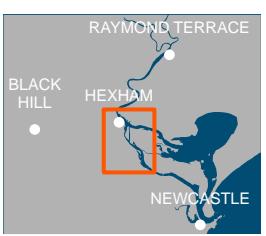


Figure 1.2 The proposal

Hexham Straight Widening

1.1.2 The EIS area

The EIS areas (refer to **Figure 1.3**) assess impacts of the proposal within land subject to the CM SEPP which are at the following three locations:

- EIS Area 1 - a small area located to the south of Ironbark Creek on the eastern side of Maitland Road and to the west of a parcel of Crown land and a section of Hunter Wetlands National Park. The land mapped as Coastal Wetlands includes areas of remnant mangrove and saltmarsh vegetation and also crosses sections of an existing track that provides access to the south bank of Ironbark Creek and to the base of Ironbark Creek Bridge. Access tracks would be required during construction and the permanent work required for the proposal in this area is comprised of road pavement, earthworks (embankment), construction of piers to support the new bridge over Ironbark Creek and the relocation of an unnamed drainage channel to the southeast of the existing bridge
- EIS Area 2 - a small area located to the north of Ironbark Creek on the eastern side of Maitland Road. The land mapped as Coastal Wetlands includes areas of remnant mangrove, saltmarsh and freshwater wetland vegetation. Access tracks would be required during construction and the permanent work required for the proposal in this area is comprised of road pavement, earthworks (embankment) and construction of piers to support the new bridge over Ironbark Creek
- EIS Area 3 - a small area located on the west bank of the south channel of Hunter River to the east of Maitland Road and to the northwest of Millams Road and the Ash Island Bridge. The land mapped as Coastal Wetlands includes areas of the road shoulder and remnant mangrove vegetation. The permanent work required for the proposal in this area is comprised of road widening work to include a third lane in the eastbound direction, as well as a new road shoulder, batter and upgrades to drainage.

There is potential for the proposal to indirectly impact other areas mapped as Coastal Wetlands under the CM SEPP. These impacts have been assessed within the EIS and relevant specialist reports. The proposal within the EIS areas would be constructed and operated together with the proposal within the REF area, which has been assessed in the REF prepared by Transport.

1.1.3 The REF area

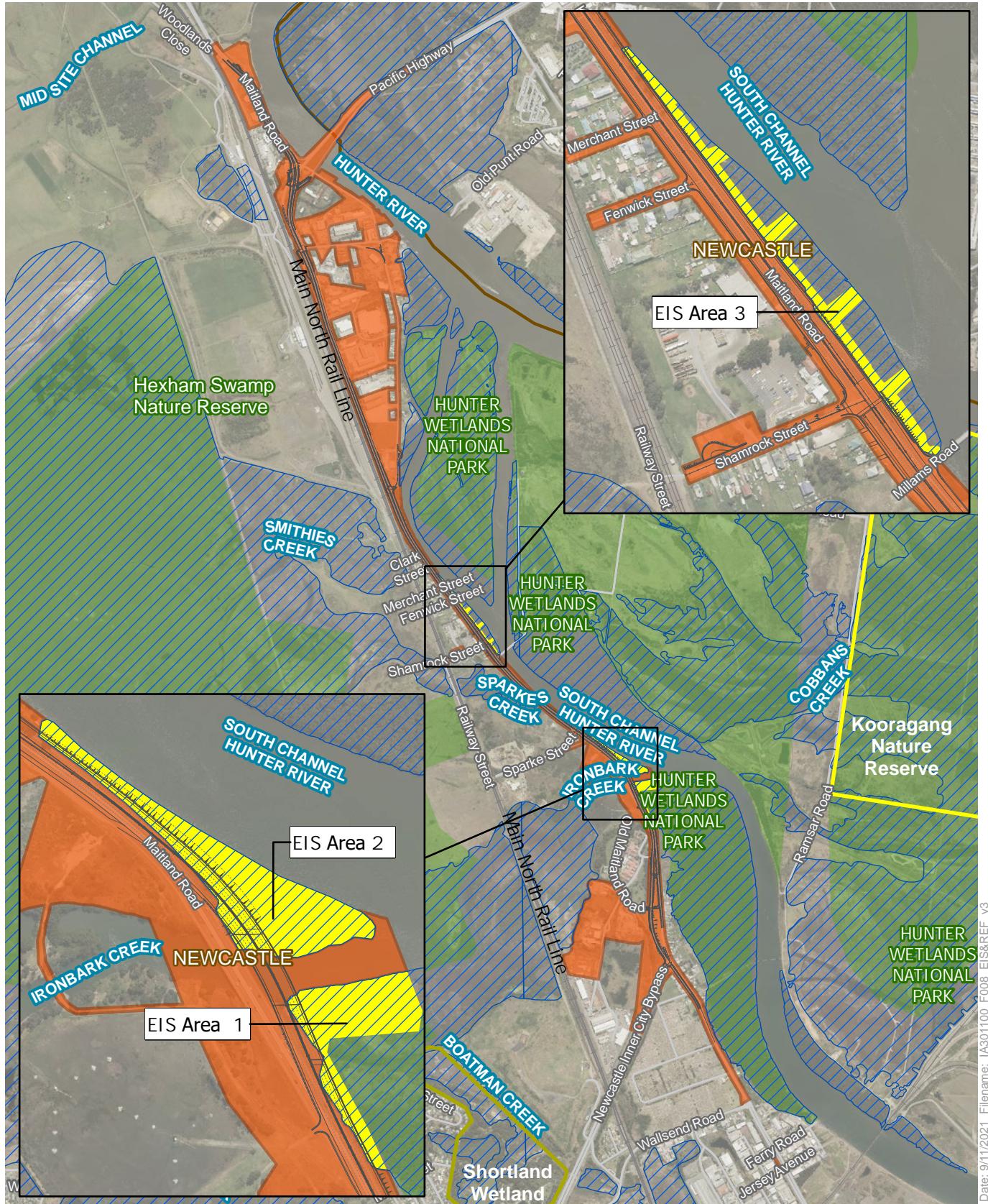
The REF area assesses all other aspects of the proposal included in **Section 1.1.1** that are outside the footprint of the EIS area described in **Section 1.1.2** and shown in **Figure 1.3**.

1.1.4 Relationship of the REF and EIS

In summary, development consent under Part 4 is not usually required for development for the purposes of a road being undertaken by Transport as a public authority. Rather, this development is assessed as an 'activity' under Part 5 of the EP&A Act.

However, on those parts of the land which are identified as 'Coastal Wetland' under the CM SEPP, the development is classified as designated development and requires consent from the City of Newcastle under Part 4 of the EP&A Act. The part of the proposal located within the Coastal Wetlands is therefore assessed under Part 4 of the EP&A Act. An EIS is required to assess the impacts of any works located within the Coastal Wetlands or any impacts on a Coastal Wetland.

A separate REF has been prepared in accordance with Division 5.1 of the EP&A Act to assess the areas of the proposal located within the REF areas. The REF would be determined by Transport. The proposal within the EIS areas would be constructed and operated together with the proposal within the REF area. Together, the EIS and the REF assess the potential environmental impacts of the proposal and it is intended that these documents be read in conjunction with each other.



Legend

- | | | |
|----------------------|---------------------------------------|--|
| — The proposal | — Railway | Yellow box: Koragang Nature Reserve |
| Yellow box: EIS area | — Road | Yellow box with green outline: Shortland Wetland |
| Orange box: REF area | — LGA | Light green box: National Park |
| | Diagonal blue lines: Coastal Wetlands | |

0 400 800 m
Scale 1:30,000 at A4
GDA94 MGA56

Data sources:
Jacobs 2020
Department Finance,
Services and Innovation 2020

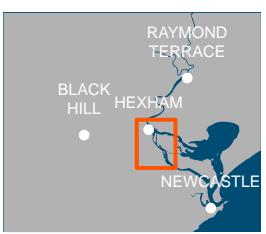


Figure 1.3 EIS area and REF area

Hexham Straight Widening

1.1.5 Location

The proposal is located about 10 kilometres north of the City of Newcastle in the suburbs of Sandgate and Hexham. To the east and in some locations next to the proposal is the Hunter River and the South Channel of the Hunter River and the proposal crosses Ironbark Creek. The major freight rail line into the Port of Newcastle uses the Main North Rail Line and this is located west of the proposal and in some locations immediately next to the proposal. The Hunter Wetlands National Park is located both to the east and west of the proposal and the area to the west is also known as Hexham Swamp Nature Reserve. Much of the low-lying national park estate as well as some other low-lying swamp areas including the larger back barrier Hexham Swamp areas are identified as wetlands under the CM SEPP. These low-lying areas connect to two areas of Ramsar listed wetlands identified as the Hunter Estuary Wetlands that includes Kooragang Nature Reserve about one kilometre to the east and Shortland Wetlands (including Hunter Wetlands Centre Australia) about 800 metres to the west of the proposal.

The land use along the proposal is characterised by a mix of transport corridors (road and rail), environmental areas including wetlands and waterways, recreational areas both public and private, residential areas and light and heavy industrial areas. The main features of the proposal area and its surrounds include:

- Sandgate Cemetery
- Calvary St Joseph's Retirement Community
- Hexham Bowling Club
- Hexham Park and Cricket Grounds
- Hexham Railway Station
- Residential properties which are located on both sides of Maitland Road to the south of the Calvary St Joseph's Retirement Community, to the west of the proposal along Shamrock Street, Fenwick Street, Merchant Street and Clark Street and along Old Maitland Road behind the industrial estate at Hexham
- Industrial and commercial properties which are located to the north of the Newcastle Inner City Bypass, off Sparke Road at Sandgate and at the northern end of the proposal to the east and north of the Hexham Railway Station.

1.2 Purpose and scope of the report

Jacobs was engaged by Transport to undertake a sustainability assessment of the proposal. The purpose of this report is to assess the potential impacts to sustainability from constructing and operating the proposal. The report:

- Describes the existing environment with respect to sustainability
- Assesses the impacts of constructing and operating the proposal on sustainability
- Recommends measures to mitigate and manage the impacts identified.

The methodology for the assessment is described in **Section 3**.

1.3 Terms and definitions

The following terms are used in this report:

- **Proposal** – the widening of a six kilometre section of Maitland Road from four lanes to six lanes, starting about 290 metres south of the intersection with the Newcastle Inner City Bypass at Sandgate, and extending through to about 760 metres north of Hexham Bridge, in Hexham, NSW
- **Construction area** – the area to be directly impacted by the proposal. This comprises the future construction footprint of the proposed bridge over Ironbark Creek and the upgrade of Maitland Road, including all roadside cut and fill, construction compound areas and parking areas for oversize and overmass vehicles, refer further to **Section 1.1.1**

- Study area – the construction area and additional areas that are likely to be affected by the proposal, either directly or indirectly
- EIS area – the areas of the proposal to be assessed under the EIS within land subject to the CM SEPP as defined in **Section 1.1.2**
- REF area – the areas of the proposal to be assessed by the REF and this covers all other aspects of the proposal included in **Section 1.1.1** that are outside the footprint of the EIS area described in **Section 1.1.2**
- Proposal local area – the area within 10 kilometres of the proposal.

1.4 Sustainability objectives

The Roads and Maritime Services *Environmental Sustainability Strategy 2019-2023* (2019) (Environmental Sustainability Strategy) has been used as the guiding framework to undertake the assessment as this was current at the time of the development of the concept design. The *Environmental Sustainability Strategy* is detailed in **Section 2.2.1**.

2. Legislative framework

2.1 NSW legislation

2.1.1 Environmental Planning and Assessment Act 1979

The concept of sustainable development has been introduced into the NSW planning and development legislation by the EP&A Act. One of the objectives outlined in Section 1.3(b) of the 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 Act encourages ecological sustainable development and the effective integration of economic and environmental considerations into decision-making processes.

Through the development of environmental management measures in this and the associated proposal specialist assessments (refer to **Section 5**), the proposal has outlined how it would facilitate the ecologically sustainable development objectives of the NSW government by bringing in economic, environmental and social considerations in the detailed design and construction of the proposal.

2.1.2 Transport Administration Act 1988 (NSW)

The *Transport Administration Act 1988* provides a common objective and service delivery priority for transport agencies to promote delivery of transport services in an environmentally sustainable in manner.

2.1.3 Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2001* advocates for waste to be handled according to the waste hierarchy:

- **Avoid** and reduce waste in the first instance
- **Recover** resources by reusing, recycling and recovering energy from waste
- Treat and **dispose** of waste as a last resort.

The above waste hierarchy would be applied to the proposal, with avoidance prioritised over recovery and disposal.

The *NSW Waste Avoidance and Resource Recovery Strategy* (NSW Environmental Protection Authority [EPA], 2014) sits under the Act and seeks "to enable all of the NSW community to improve environment and community well-being by reducing the environmental impact of waste and using resources more efficiently." The strategy establishes six key result areas: avoid and reduce waste generation; increase recycling; divert more waste from landfill; manage problem wastes better; reduce litter; and reduce illegal dumping.

2.1.4 Modern Slavery Act 2018

The *Modern Slavery Act 2018* (NSW) was passed by NSW Parliament in June 2018. The Act recognises that modern slavery is prevalent around the world and in NSW and sets out steps to ensure NSW does not contribute to these crimes.

This legislation requires corporations operating in Australia and non-corporate Commonwealth entities to submit an annual modern slavery statement to the Commonwealth, detailing risks of modern slavery in their operations and supply chains. While this legislation would not be mandatory for Transport, voluntary modern slavery statements can be submitted annually to the Commonwealth under the Act.

The Act has not commenced and so its directions are not in force however, it is scheduled to come in effect in 2021. The proposal would seek to align with the objectives of the legislation. The *Sustainable Procurement Plan* to be developed for the proposal prior to construction would include information about actions taken to address risks of modern slavery in the proposal's supply chains, and the provision of relevant reporting.

2.2 Relevant policies, guidelines and strategies

The following policies, guidelines and strategies are relevant to the proposal and in particular, the *Environmental Sustainability Strategy 2019 -2023* (Roads and Maritime Services, 2019). The relevance of these to the proposal are described in the sections that follow.

2.2.1 Roads and Maritime Services Environmental Sustainability Strategy 2019-2023 (2019)

The *Environmental Sustainability Strategy* (Roads and Maritime Services, 2019) has been developed in context of NSW legislation and policies/guidelines. **Figure 2.1** demonstrates the relationship between the *Environmental Sustainability Strategy* and its policy and planning setting. (refer to **Section 2.1**). The *Environmental Sustainability Strategy* identifies 10 focus areas to embed sustainability into the delivery of Roads and Maritime infrastructure and services. It defines objectives and targets for sustainability in the context of Transport projects. **Section 4.2** discusses the objectives of the *Environmental Sustainability Strategy* and how the proposal responds to those objectives.

The *Environmental Sustainability Strategy* also defines the sustainability delivery model and targets in the context of Transport projects. It also establishes focus areas, targets and initiatives for Transport (formerly Roads and Maritime Services) projects and operation activities.

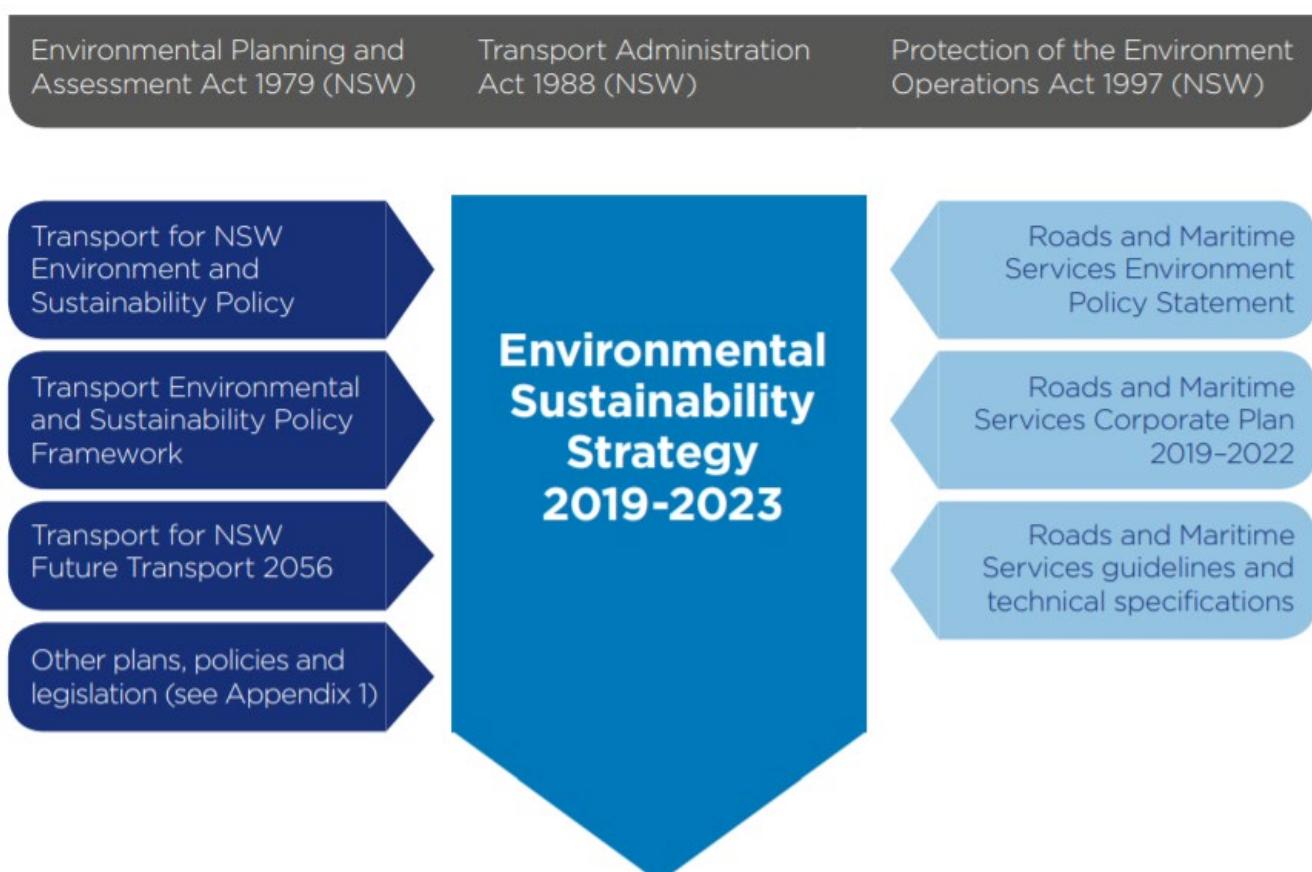


Figure 2.1 Environmental Sustainability Strategy context

Source: Environmental Sustainability Strategy (Roads and Maritime, 2019)

2.2.2 Transport Environment and Sustainability Policy Framework and Statement

The Transport *Environment and Sustainability Policy* (Transport for NSW, 2020a) provides the priorities and direction for implementing sustainability initiatives during the planning, design and operation phases of all Transport projects. Through the policy, Transport is "committed to delivering transport which contributes to economic prosperity and social inclusion in an environmentally responsible and sustainable manner, consistent with the Future Transport Strategy 2056."

Transport will "work towards achieving this for NSW by:

- Leadership – contributing to and influencing the strategic environment and sustainability agenda of the NSW Government
- Environmental protection – being accountable for addressing and minimising the environmental impacts of our activities to satisfy the expectations and legislative requirements of the NSW Government and community
- Energy and carbon – improving energy efficiency and working towards net zero carbon emissions
- Resilience – embedding climate risk and resilience considerations in our activities
- Sustainable procurement – procuring and delivering sustainable, efficient and cost-effective transport options, including responsible supply chains
- Whole of life – considering whole of life benefits and impacts from our activities across all life cycle stages - demand/need, plan, acquire, operate/maintain and disposal
- Social – recognising the social impacts and benefits of our activities, and working for healthy liveable communities
- Awareness – raising the awareness and capacity of our workforce to be accountable for implementing the Policy through their activities to achieve enhanced environmental outcomes and a culture of environmental responsibility
- Communication – communicating openly, responsively and empathetically with our customers, partners and stakeholders on environmental matters and report on our performance."

2.2.3 NSW Government Resource Efficiency Policy

The aim of the *NSW Government Resource Efficiency Policy* (GREP) (OEH, 2019) is to reduce the NSW Government's operating costs and lead by example in increasing the efficiency of its resource use. The policy aims to drive resource efficiency through energy, water, waste and clean air objectives, helping to reduce the NSW Government's operating costs and lead by example in increasing its resource efficiency. Relevant GREP objectives include:

- A minimum 4.5 star NABERS energy rating for all owned and leased buildings
- Minimum fuel efficiency standards for all new light vehicles
- Minimum standards for new electrical appliances and equipment
- Minimum water standards for office buildings and ongoing water use reporting requirements
- Reporting on top three waste streams
- Minimum air emission standards for all non-diesel plant and equipment

Resource use efficiency is a key sustainability objective for the proposal across materials, energy, water and air quality. Monitoring and reporting on an annual basis is a key component of the GREP, which involves voluntary reporting of Transport meeting resource efficiency objectives outlined in GREP through its operations and projects.

The *Hexham Straight Widening Flooding and Hydrology Assessment* (Jacobs, 2021e) and the *Hexham Straight Widening Surface Water and Groundwater Assessment* (Jacobs, 2021h) include environmental management measures to efficiently manage proposal water use. The *Hexham Straight Widening Phase 1 Soils and Contamination Assessment* (Jacobs, 2020) also includes environmental management measures to efficiently manage and minimize waste including use of spoil, stockpiles and earthworks generated from construction of the proposal. Resource and Waste Management and Greenhouse Gas assessments were not included in the proposal scope and therefore have not been directly assessed for this proposal.

2.2.4 NSW Future Transport Strategy 2056

The *NSW Transport Future Strategy 2056* (Transport, 2018) is an update to the previous *NSW Long Term Transport Master Plan*. It underpins and supports the *State Infrastructure Strategy* and sets the 40-year vision, strategic directions and outcomes for mobility in NSW. The *Future Strategy 2056* incorporates supporting plans including the Regional NSW Services and Infrastructure Plan, to provide a 40-year vision, direction and outcomes for transport and traffic in NSW.

The strategy's vision is built on six outcomes, including the following three that are relevant to sustainability on this proposal:

- Successful Places, by encouraging active travel (walking and cycling), refer to the *Hexham Straight Widening Traffic and Transport Assessment* (Jacobs, 2021i)
- A Strong Economy, by connecting people to jobs, goods and services in our cities and regions, refer to the *Hexham Straight Widening Socio-Economic Assessment* (Jacobs, 2021f)
- Sustainability, by making the best use of available resources and assets, refer to the *Hexham Straight Widening Flooding and Hydrology Assessment* (Jacobs, 2021e) and the *Hexham Straight Widening Surface Water and Groundwater Assessment* (Jacobs, 2021h).

2.2.5 Beyond the Pavement

Beyond the Pavement (Roads and Maritime, 2020) seeks to integrate urban design into the planning, development, delivery and management of Transport assets. It establishes procedures and urban design management principles.

Key urban design principles identified in the *Beyond the Pavement* that relate to sustainability are:

- Contributing to urban structure, urban quality and the economy
- Connecting modes and communities and promoting active transport
- Contributing to green infrastructure and responding to natural systems
- Connecting to Country and incorporating heritage and cultural contexts
- Achieving integrated and minimal maintenance design.

The *Hexham Straight Widening Urban Design, Landscape Character and Visual Impact Assessment* (Tract, 2021) for the proposal has been developed based on the principles outlined in the Beyond the Pavement plan.

2.2.6 NSW Government Procurement Policy Framework

The *NSW Procurement Policy Framework* (NSW Government, 2021) provides a consolidated view of government procurement objectives and the Procurement Board's requirements as they apply to each step of the procurement process. It contains five objectives including 'Objective 5 – Sustainable Procurement'. Sustainable procurement focuses on spending public money efficiently, economically and ethically to deliver value for money on a whole of life basis. Sustainable procurement extends the assessment of value for money beyond the sourcing process, considering benefits and risks to the organisation, the community, the economy and impacts on the environment.

Sustainable procurement should:

- Considers how procurement impacts society, the economy and the environment
- Provides all suppliers with full and fair opportunities to compete
- Respects stakeholders' interests, the rule of law and human rights
- Seeks innovative solutions to address sustainability throughout the supply chain
- Buys only what is needed or seek sustainable alternatives
- Analyses all procurement costs, including benefits for society, environment and the economy
- Integrates sustainability into procurement practices.

The NSW procurement framework would provide specific requirements and guidance for the proposal to utilise procurement to facilitate sustainable outcomes around reducing NSW Government's operating costs and ensures the effective and efficient use of resources and maximise the conservation of natural resources. It also provides proposal procurement with requirements and guidance to minimise risks in the supply chain and provide economic benefit to the community through employment and business engagement.

2.2.7 Small to Medium Enterprise and Regional Procurement Policy

The *Small to Medium Enterprises (SMEs) and Regional Procurement Policy* (NSW Government, 2020) applies to all government goods and services procurement activity (excluding construction) from February 2019 and aims to support SMEs and local businesses win opportunities in providing goods and services to government across all procurement values. The policy objectives are to:

- Support local businesses, start-ups and innovation and primary industries,
- Build SME capability to supply government,
- Make supplying to government easy for SMEs, and
- Listen to local businesses and measure participation.

2.2.8 Transport's Social Procurement Workforce Development Resource Guide

The *Social Procurement and Workforce Development Guide* (Transport, 2020b) has been developed to guide contractors on how to create and complete the required plans to meet Transport's social procurement and workforce development objectives. Through implementation of effective social procurement plans, Transport is seeking to maximise the economic, social and environmental benefits of these considerable investments.

The proposal would use the guide to satisfy these minimum benchmarks through the development and implementation of a sustainable procurement plan.

2.2.9 NSW Aboriginal Procurement Policy

The *Aboriginal Procurement Policy* (NSW Government, 2021) aims to create opportunities for Aboriginal-owned businesses and encourage employment and training through the supply chain of NSW Government contracts. The policy requires that a minimum of 1.5 per cent of project spend for contracts valued at \$7.5 million or above must be dedicated to Aboriginal participation. This includes:

- Aboriginal employment
- Engagement of Aboriginal owned businesses to provide goods and services to a project
- Education and training
- Engagement and consultation with Aboriginal organisations or businesses.

The proposal would satisfy these minimum benchmarks through the development and implementation of an Aboriginal Participation Plan which sets minimum targets for Aboriginal participation at or above 1.5 per cent of proposal spend.

2.2.10 United Nations Sustainable Development Goals

The *Sustainable Development Goals* (SDGs) (United Nations, 2015) were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. Other policies and objectives outlined in this section refer to the UN SDGs, as these SDGs provide context and reference for overarching sustainability issues which require attention. Of the 17 SDGs, the following six are relevant to the proposal:

- Goal 8: Decent Work and Economic Growth
- Goal 9: Industry, Innovation and Infrastructure
- Goal 11: Sustainable Cities and Communities
- Goal 12: Responsible Consumption and Production
- Goal 13: Climate Action
- Goal 15: Life on Land.

The proposal would align with these goals through management measures designed to improve the economic, social and environmental outcomes of the proposal.

2.2.11 NSW Circular Economy Policy

The *NSW Circular Economy Policy* (NSW Government , 2019a) provides a framework for implementing initiatives to create circular product and service lifecycles. The Policy provides direction for developing circular principles in manufacturing, processing, design and waste.

The Policy focuses on seven key principles which will underpin NSW Government decision making and planning:

- Sustainable management of all resources – increasing use of recycled products
- Valuing resource productivity – maximising the value of resources through recycling and re-use
- Design out waste and pollution – designing products with recycling and re-use in mind, reducing demand for new landfills and increasing availability of repair and remanufacturing services.
- Maintain the value of products and materials – development of local markets for post-consumer recycled products and reducing dependency on international markets
- Innovate new solutions for resource efficiency – increase the value in recycled and reused products and increase resource efficiency through innovative technology
- Create new circular economy jobs – create jobs in new manufacturing, service and resource recovery sectors
- Foster behaviour change through education and engagement – Engage with communities and businesses on the benefits of circular economy principles and how these can be implemented at a local level.

The Policy outlines three 'next steps' in implementing a circular economy in NSW"

- Embed circular economy consideration in NSW Government decision making
- Incorporate circular economy principles in NSW government policies and strategies
- Plan the transition into a circular economy.

2.2.12 NSW Net Zero Plan Stage 1 2020-2030

The *NSW Net Zero Plan (Stage 1)* (NSW Government, 2019b) details the four priorities of the NSW Government in order to achieve the target of net-zero emissions by 2050. The priorities focus on increasing less emission intensive alternatives to NSW primary industries through funding and investment in technology. The priorities also focus on providing low emission alternatives to consumers and businesses. The four priorities identified by the NSW Government are:

- 1) Drive uptake of proven emission reduction technologies.
- 2) Empower consumers and businesses to make sustainable choices
- 3) Invest in the next wave of emissions reduction innovation
- 4) Ensure the NSW Government leads by example.

3. Methodology for the assessment

The sustainability assessment for the proposal has considered the application of sustainability principles, and the opportunities to satisfy the objective of Section 1.3(b) of the EP&A Act.

The assessment involved:

- Defining the sustainability context for the proposal within the broader context of NSW's objective of improving transport efficiency, and the relevant Transport policies and guidelines (refer to **Section 2**)
- Reviewing the sustainability focus areas, associated objectives from the Environmental Sustainability Strategy and responding to how these focus areas apply to the proposal (refer to **Section 4.2**)
- Identifying requirements for managing sustainability during detailed design, construction and operation (refer to **Section 5**).

The assessment considered whole of life mitigation in response to the focus areas and objectives. Sustainability is a very broad topic, and specific disciplines have assessed their impacts in separate specialist assessments. (Refer to **Table 3.1**. The assessment is discussed further in **Section 4.2**.

Table 3.1 Sustainability focus areas, objectives and specialist assessments

Sustainability focus area	Objective	Relevant specialist assessment
Energy and carbon management	Minimise energy use and reduce carbon emissions without compromising the delivery of services to our customers.	Not addressed in this assessment
Climate change resilience	Design and construct transport infrastructure to be resilient or adaptable to climate change impacts.	<ul style="list-style-type: none"> ▪ <i>Hexham Straight Widening Climate Change Assessment</i> (Jacobs, 2021c) ▪ <i>Hexham Straight Widening Coastal Processes Assessment</i> (Jacobs, 2021d) ▪ <i>Hexham Straight Widening Water – Flooding and Hydrology Assessment</i> (Jacobs, 2021e)
Air quality	Minimise the air quality impacts of road projects and support initiatives that aim to reduce transport related air emissions.	<ul style="list-style-type: none"> ▪ <i>Hexham Straight Widening Air Quality Assessment</i> (Jacobs, 2021a)
Resource use and waste management	Minimise the use of non-renewable resources and minimise the quantity of waste disposed to landfill.	<ul style="list-style-type: none"> ▪ <i>Hexham Straight Widening Phase 1 Soils and Contamination Assessment</i> (Jacobs, 2020)
Pollution Control	Minimise noise, water and land pollution from road and maritime construction, operation and maintenance activities.	<ul style="list-style-type: none"> ▪ <i>Hexham Straight Widening Noise and Vibration Assessment</i> (SLR, 2021) ▪ <i>Hexham Straight Widening Surface Water and Groundwater Assessment</i> (Jacobs, 2021h) ▪ <i>Hexham Straight Widening Phase 1 Soils and Contamination Assessment</i> (Jacobs, 2020)

Sustainability focus area	Objective	Relevant specialist assessment
Biodiversity	Improve outcomes for biodiversity by avoiding, mitigating or offsetting the potential impacts of road and maritime projects on plants, animals and their environments.	<ul style="list-style-type: none"> ▪ <i>Hexham Straight Widening Biodiversity Assessment Report</i> (Jacobs, 2021b)
Heritage – Aboriginal and non-Aboriginal	Manage and conserve cultural heritage according to its heritage significance and contribute to the awareness of the past.	<ul style="list-style-type: none"> ▪ <i>Hexham Straight Widening Statement of Heritage Impact</i> (Jacobs, 2021g) ▪ <i>Hexham Straight Widening Aboriginal Archaeological Survey Report</i> (EMM, 2019) ▪ <i>Hexham Straight Widening Aboriginal Cultural Values Assessment Report</i> (EMM, 2021)
Liveable communities	Provide high quality urban design outcomes that contribute to the sustainability and liveability of communities in NSW.	<ul style="list-style-type: none"> ▪ <i>Hexham Straight Widening Landscape Character and Visual Impact Assessment</i> (Tract, 2021) ▪ <i>Hexham Straight Widening Socio-economic Assessment</i> (Jacobs, 2021f)
Sustainable Procurement	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.	This assessment

4. Assessment of the proposal

4.1 Overview

Sustainability, or sustainable development, can be defined in different ways depending on the application and context in which it is being applied.

This report assesses the proposal against the key sustainability guidance document, the *Environmental Sustainability Strategy 2019-23* (Roads and Maritime, 2019) (refer to **Section 4.2**).

Specific disciplines have addressed the focus areas and objectives in other proposal specialist assessments separate to this document. **Table 4.1** provides the references to where the impacts and mitigations for the focus areas have been specifically addressed.

4.2 Environmental Sustainability Strategy

The proposal was developed under Roads and Maritime *Environmental Sustainability Strategy* prior to the merger with Transport in late 2019. **Table 4.1** details the proposal response to the objectives of the focus areas.

Table 4.1 Sustainability focus areas that relate to key environmental constraint for the proposal

Sustainability focus area (Roads and Maritime, 2019)	Proposal response
Energy and carbon management	<p>The proposal will allow a greater volume of traffic to travel through the road network which will facilitate an increase in energy use and greenhouse gas emissions associated with road travel. The reduction in congestion will mean that the traffic transits the area more efficiently than if the proposal were not constructed. No quantification of the change in energy or greenhouse gas emissions has been made for this proposal.</p>
Resource use and waste management	<p>A procurement strategy to minimise unnecessary consumption of materials and waste generation in accordance with relevant legislation and guidelines would be prepared.</p> <p>Potential resource use and waste management risks during construction and operation are detailed in the <i>Hexham Straight Widening Surface Water and Groundwater Assessment</i> (Jacobs, 2021h), <i>Hexham Straight Widening Phase 1 Soils and Contamination Assessment</i> (Jacobs, 2020) and <i>Hexham Straight Widening Noise and Vibration Assessment</i> (SLR, 2021).</p> <p>These specialist assessments have also developed environmental management measures to respond to, and control the risks identified. These are summarised below.</p> <p>Materials consumption will be an impact on the proposal. A procurement strategy to minimise unnecessary consumption of materials and waste generation in accordance with relevant legislation and guidelines would also be prepared to satisfy effective and efficient use of resources, and conservation of natural resources.</p> <p>Water consumption will also be an impact on the proposal, required both for construction operational phases. Reduction in reliance on potable water implementation of water efficiency measures will be considered in detailed design and construction.</p> <p>A <i>Hexham Straight Widening Surface Water and Groundwater Assessment</i> (Jacobs, 2021h) has been prepared for the proposal which proposes that the proposal develop a water reuse strategy for both construction and operational phases of the proposal, to reduce reliance on potable water. This strategy would outline alternative water supply options to potable water, with the aim of reusing water collected on-site in temporary construction sediment basins where feasible.</p> <p>Water consumption will be an impact on the proposal, required both for construction and operational phases. The <i>Hexham Straight Widening Flood and Hydrology Assessment</i> (Jacobs, 2021e) estimated that a total of 7,747 kilolitres (kL) of water is required during the construction of the proposal. To manage water usage, the Assessment recommends to utilise water captured within the sediment retention basins for dust suppression and fill conditioning, and to store and use remaining captured water from these basins for any operational usage. The assessment also considers utilising dewatering discharge produced through temporary construction dewatering for the sediment basins.</p>

Sustainability focus area (Roads and Maritime, 2019)	Proposal response
Climate change resilience	<p>Environmental management measures proposed in the <i>Hexham Straight Widening Climate Change Assessment</i> (Jacobs, 2021c) to manage the impacts expected from climate change include:</p> <ul style="list-style-type: none"> ▪ Detailed design should incorporate the full range of temperature projections, as well as expected life of bridge components, when materials are specified. ▪ Ensure that revegetation and landscaping design: <ul style="list-style-type: none"> - Considers climate change projections in the selection of species (both in and outside the floodplain) - Considers how vegetation will contribute to or support the structural integrity of soils in a changing climate. - Ensures any newly plant/tree species selection (and location of trees) to cater for potential impacts if burnt (e.g. falling onto Motorway) ▪ A material durability report (or report section) will be prepared and actioned which will specifically review the potential impacts of climate change on concrete durability, including depth of cover over reinforcement. ▪ The climate change scenarios presented in the Flooding and Hydrology Paper will be reviewed to confirm whether any design changes are required to provide ongoing resilience to the asset, or to minimise any impact on the surrounding area. <p>The <i>Hexham Straight Widening Hydrology and Flooding Assessment</i> (Jacobs 2021e) assessed impacts of climate change on flooding during the operational phase of the proposal. The assessment predicted that flood depths would generally increase by 0.05 to 0.1 metres in the 1% annual exceedance probability event by 2050 and by 0.1 to 0.25 metres by 2100 due to climate change, across the entire proposal area.</p> <p>Further flood modelling is to be undertaken during the detailed design stage, and the Assessment states that Transport will consult with landowners about reasonable and feasible mitigation measures in relation to individual properties, should the detailed design stage modelling show adverse flood impacts.</p> <p>The <i>Hexham Straight Widening Coastal Processes Assessment</i> (Jacobs 2021d) concludes that the proposal is expected to have minimal impacts on coastal processes, with minimal impacts to the overall current and wave conditions in the Hunter Estuary. The assessment states that a Construction Coastal Impacts Management Plan and erosion and sediment control plans (as part of the Construction Soils and Water Management Plan) would be developed and implemented prior to construction to manage potential coastal process impacts resulting from any proposed instream works in Ironbark Creek.</p> <p>In terms of climate change impacts on the proposal, the <i>Hexham Straight Widening Coastal Processes Assessment</i> identified that rising sea levels are expected to impact on coastal processes within the lower Hunter Estuary. Rising sea levels may inundate low-lying areas, displace</p>

Sustainability focus area (Roads and Maritime, 2019)	Proposal response
	<p>wetlands and alter the tidal regime in the estuary. These changes would likely result in morphological changes and impact the water quality in the estuary.</p> <p>Sections of the riverbank within the proposal may be subject to bank instabilities, particularly the section between the Ash Island Bridge and the Ironbark Creek Bridge. Riverbanks and coastal areas are likely to become more susceptible to erosion without bank protection.</p> <p>Refer to the <i>Hexham Straight Widening Hydrology and Flooding Assessment</i> (Jacobs, 2021e) for a detailed description of the climate change impacts on flooding across the study area and the <i>Hexham Straight Widening Coastal Processes Assessment</i> (Jacobs, 2021d) for a description of impacts on the coastal landform across the study area.</p>
Air quality	<p>The proposal would minimise the air quality impacts aimed at reducing transport related air emissions. Refer to the <i>Hexham Straight Widening Air Quality Assessment</i> (Jacobs, 2021a) for details on potential impacts and environmental management measures.</p> <p>Key air quality issues for the proposal were identified as dust during construction and emissions from vehicles using the existing and modified road network during operation. Other potential air quality issues included odour from the handling of contaminated soils from historical land uses.</p> <p>The key outcomes of the air quality assessment are:</p> <ul style="list-style-type: none"> ▪ Construction of the proposal without mitigation was determined to represent a 'high' risk of dust impacts. The application of the recommended mitigation measures would mean that adverse residual impacts from construction would not be anticipated ▪ Operation of the proposal would lead to a redistribution of vehicle emissions across the road network, generally from existing main roads to the proposed new roads. The highest concentrations of key air quality indicators (CO, NO₂, PM10 and PM2.5) are expected to occur close to main roads under all 'with proposal' and 'without proposal' scenarios ▪ The predicted maximum increases and decreases in concentrations of key air quality indicators, due to the proposal, are within the range of historically measured fluctuations in maximum concentrations for the region ▪ The proposal would lead to very little change to maximum and annual concentrations of key air quality indicators, relative to background levels, based on model predictions at selected sensitive receivers located near main roads along the proposed route ▪ The proposal is not expected to cause exceedances of the NSW EPA air quality impact assessment criteria for CO, NO₂, PM10, PM2.5 or key air toxics such as benzene and formaldehyde. <p>The assessment includes the identification of management measures including appropriate work practices and scheduling, equipment selection, monitoring and preventative controls. These measures would be incorporated into the Air Quality Management Plan.</p>

Sustainability focus area (Roads and Maritime, 2019)	Proposal response
Pollution control	<p>Water quality</p> <p>Construction and operation of the proposal has potential to impact on surface water and groundwater water quality within the study area. This includes waterways, wetlands and aquifers that support ecosystems and community potable water supply. During construction, impacts on surface water may be associated with construction activities causing erosion and sedimentation, mobilising sediments into receiving environments. Impacts on groundwater may be associated with temporary groundwater dewatering and introduction or mobilisation of contaminants. It is expected that with the application of the standard and proposal specific management measures, potential impacts would be minor and manageable.</p> <p>The proposal design includes construction water quality strategies to manage water quality impacts from proposal construction, which includes diversion drains, water quality treatment basins, sediment fences culverts and visual monitoring. Sediment basins are not required as the sub-catchment areas of disturbance were assessed to be relatively small, due to the linear nature of the proposed road upgrade. However, sediment sumps are recommended upstream of outlets points from construction sites. This means that for catchments that are smaller than 0.5 hectares, only local sediment controls, such as sediment fences, or filters logs, would be required. Five locations have been identified, where water quality basins are required during operations, where water is treated before being discharged, refer further to the <i>Hexham Straight Widening Surface Water and Groundwater Assessment</i> (Jacobs, 2021h).</p> <p>Land</p> <p>Based on the <i>Hexham Straight Widening Phase 1 Soils and Contamination Assessment</i> (Jacobs, 2020) there are three 'high risk' areas of environmental interest during construction were identified as well as several moderate-risk areas of environmental interest within the proposal construction footprint. Potential contamination risks include:</p> <ul style="list-style-type: none"> ▪ Herbicide application during construction which would runoff into waterways (Ironbark Creek, Hunter River and South Channel Hunter River) ▪ Discarded waste and stockpiles along the eastern verge of Maitland Road also running off into nearby waterways ▪ Disturbance of acid-sulphate soils which are common in and around the construction area ▪ Potential contamination from the demolition of Ironbark Creek Bridge. <p>The mitigation measures suggested from the <i>Hexham Straight Widening Phase 1 Soils and Contamination Assessment</i> is to undertake a targeted sampling program as part of a Phase 2 investigation and prepare a contamination management plan as part of the CEMP to address the findings from the Phase 2 assessment.</p> <p>The main risk from the operational use of the motorway is from large scale chemical or hydrocarbons spills from freight transport. These would be minimised through good design and subsequently managed by a combination of authorities (Transport, Police and other emergency services) as individual scenarios require.</p>

Sustainability focus area (Roads and Maritime, 2019)	Proposal response
	<p>Noise</p> <p>The <i>Hexham Straight Widening Noise and Vibration Assessment</i> (SLR, 2021) assessed the potential noise pollution impacts that would be caused by the construction and operation of the proposal. The assessment notes that:</p> <ul style="list-style-type: none"> ▪ The nearest receivers to the proposal along the entire alignment would be subject to highly intrusive worst-case noise impacts during construction, especially during the operation of rock breakers and concrete saws ▪ Adverse noise impacts are expected during proposed evening and night-time construction works ▪ Vibratory rollers and rockbreakers are proposed to come within minimum working distances of nearby receivers, and therefore have the potential to cause vibration impacts to structures and human comfort ▪ A total of 74 receivers are predicted to have noise exceedances from operational road traffic and have been identified as being eligible for consideration of additional noise mitigation ▪ It is noted that an increase of more than 2 dB(A) is not expected at any receivers from traffic noise. <p>The inclusion of potential noise management measures in the proposal design, such as quieter pavements, noise barriers and/or at-property noise mitigation treatment, would aid in reducing maximum noise levels to affected residential receivers during operation of the proposal. The application of these management measures into the proposal design would be investigated further during detailed design. Treatments should be carried out in accordance with the <i>Noise Mitigation Guideline</i> (RMS, 2015).</p> <p>The proposal would seek to mitigate and manage noise pollution impacts during construction through the preparation and adherence to a construction noise and vibration management plan. The management plan would include consideration of different plant and equipment, scheduling of noise intensive equipment during less sensitive periods (i.e. standard hours), noise and vibration monitoring and building surveys.</p>
Biodiversity	<p>The proposal has sought to improve outcomes for biodiversity by avoiding, mitigating or offsetting the proposal's potential impacts on threatened species (flora and fauna), populations and ecological communities.</p> <p>The greatest risk to threatened species as a result of the proposal would be the potential impacts to the breeding and foraging site of the Southern Myotis, located at Ironbark Creek Bridge. Due to the presence of a breeding population of Southern Myotis (<i>Myotis macropus</i>) currently using the drainage structures associated with the existing Ironbark Creek bridge, it is recommended that a Microbat Management Plan (MMP) be prepared, refer to the <i>Hexham Straight Widening Biodiversity Assessment Report</i> (Jacobs, 2021b) for further detail.</p> <p>A Flora and Fauna Management Plan would also be prepared in accordance with Biodiversity Guidelines and implemented as part of the CEMP. The proposal has also reduced the area of remnant vegetation alongside existing road alignment and increased fragmentation of habitat which may reduce its suitability for some migratory and wetland species. The proposal will require the removal of 3.82 hectares of native vegetation within the REF area and 2.73 hectares of native vegetation within the EIS area.</p>

Sustainability focus area (Roads and Maritime, 2019)	Proposal response
	<p>The REF area includes four plant community types (PCTs) comprised of three threatened ecological communities (TECs) listed under the <i>Biodiversity Conservation Act 2016</i> (BC Act) and two TEC listed under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act). Offsets in the REF area will be required in accordance with the Department of Primary Industries (DPI) 'no net loss' habitat policy for the REF areas of two PCTs that are saline wetland formations comprised of saltmarsh and grey mangrove. These areas are also identified as areas of key fish habitat under the <i>Fisheries Management Act 1994</i>. Further to this, the loss of breeding/roosting habitat for the Southern Myotis habitat in the REF area will require compensatory habitat measures and should be addressed in the Microbat Management Plan. Fragmentation of this area may have reduced its suitability as habitat for some migratory and wetland species.</p> <p>The EIS area impacts on four PCTs of which three are TECs under the BC Act and two are part of one TEC under the EPBC Act. Offsets for the EIS area will be in accordance with the NSW Biodiversity Offset Strategy. As part of the EIS area, up to 2.55 hectares of CM SEPP would be removed or damaged by the EIS area. The CM SEPP coastal wetlands which are predicted to be impacted by the EIS area includes saltmarsh and mangrove communities (TYPE 1 and 2 habitats). NSW DPI enforces a 'no net loss' habitat policy as a condition of consent (DPI, 2013). PCTs that are classified under the Vegetation Classification database as being in the saline wetlands formation (i.e. saltmarsh and mangroves) have been assessed according to the BAM. Further consultation with NSW Fisheries will occur to ensure offsets for these vegetation types are acceptable and meet the <i>Policy and guidelines for fish habitat conservation and management</i> (DPI, 2013).</p>
Heritage – Aboriginal and non-Aboriginal	<p>The proposal has and would continue to manage and conserve cultural heritage according to its heritage significance and contribute to the awareness of the past.</p> <p>Aboriginal and non-Aboriginal heritage assessments of the proposal area have been carried out. These investigations have identified impacts on heritage. These impacts have been minimised, avoided and mitigated where practicable and management measures to be implemented throughout construction of the proposal have been provided.</p> <p>A <i>Hexham Straight Widening Statement of Heritage Impact</i> (SoHI) has been carried out for the proposal to assess non-Aboriginal heritage, refer to Jacobs, 2021, which identified potential indirect impacts to the Sandgate Cemetery, 2HD Studios, A former Travelers Rest Hotel, Hexham Railway Station, Hexham Bridge, Oak Factory, Hannell Family Vault and Hexham Shipbuilding Yards. No heritage item would however be directly impacted. Management measures have been developed and proposed for the proposal to avoid, minimise to the greatest extent possible and manage the unavoidable impacts to non-Aboriginal heritage items. These management measures would be detailed in the proposal's Construction Environmental Management Plan (CEMP).</p> <p>The <i>Hexham Straight Widening Aboriginal Archaeological Survey Report</i> (EMM, 2019) was carried out to identify areas of Aboriginal cultural local significance and communicated to the local Aboriginal community. Consultation with Aboriginal stakeholders has been carried out in accordance with the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Roads and Maritime, 2011) and has involved meetings with affected Aboriginal stakeholder groups, site surveys attended by registered aboriginal parties, including vehicle traverses and pedestrian surveys. Consultation with Aboriginal stakeholders will be ongoing throughout proposal development. The Aboriginal Cultural Heritage Assessment Report (EMM, 2021) identified three key elements of cultural value across the proposal area: The</p>

Sustainability focus area (Roads and Maritime, 2019)	Proposal response
	<p>Burraghihnbihng Wetlands, Hunter River and estuary islands and Water Spirit. The Assessment concluded that an Aboriginal Heritage Management Plan should be prepared and implemented as part of the CEMP and should provide specific guidance on mitigation and protection measures.</p> <p>The report also concludes that Aboriginal culture heritage awareness training should be included as part of site induction for all personnel, ensuring awareness of the cultural significance of the project area.</p> <p>Finally, the assessment concludes that Hexham Bridge should be renamed in recognition of Aboriginal cultural values and history in the region, and that the official name of Ironbark Creek (Toohrnbing Creek) and Hunter River South Channel (Coquun) be recognized by applying the names in all Transport materials and signage.</p> <p>Management recommendations were developed for the Aboriginal heritage items that would be impacted by the proposal. In general, the first principle of cultural heritage management is to avoid impact before applying mitigation.</p>
Livable communities	<p>The proposal has sought to deliver urban design outcomes that contribute to community sustainability and livability with the urban design vision, objectives and principles considering:</p> <ul style="list-style-type: none"> ▪ Project objectives ▪ The project SEARs ▪ The principles outlined in Beyond the Pavement ▪ The contextual analysis of the existing environment. <p>The proposal passes within or near to existing road corridors, helping to minimise potential visual amenity and landscape character impacts, particularly in residential areas. The proposal's design has been developed in recognition of existing natural, built and community values and has sought to minimise potential adverse impacts of the proposal on the visual amenity of the built and natural environment (including public open space), wherever possible, while capitalising on opportunities to improve visual amenity.</p> <p>Transport would continue to develop the design in accordance with the urban design objectives and principles during future proposal phases and the design development would follow the landscape and visual amenity objectives developed for the proposal. Refer to the <i>Hexham Straight Widening Urban Design, Landscape Character and Visual Impact Assessment</i> (Tract, 2021) for details on the design's integration of the urban design vision, objectives and principles for the proposal.</p> <p>The proposal would contribute to reducing traffic on the existing local road network and would additionally work towards improving cycling and pedestrian opportunities. A key outcome of the proposal traffic operational modelling discussed in the <i>Hexham Straight Widening Traffic and Transport Assessment</i> is that the proposal would either maintain or improve outcomes for cycling traffic with new and updated cycling infrastructure and substantially reduce rear-end crashes, lane change crashes and off-road crashes.</p>

Sustainability focus area (Roads and Maritime, 2019)	Proposal response
	Cyclists would be able to use the dedicated two metre wide shoulders provided along Maitland Road / Pacific Highway / New England Highway and a new and updated shared path to the north of Hexham Bridge and the on and off ramps of the A1 Pacific Highway. Refer to the <i>Hexham Straight Widening Traffic and Transport Assessment</i> (Jacobs, 2021i) for further detail.
Sustainable procurement	<p>The proposal would seek to drive sustainable procurement for the goods and services required to deliver the proposal; and contribute value to the environmental, social and economic wellbeing of the community, in alignment with the requirements in the NSW Government Procurement Policy Framework. Sustainable procurement extends the assessment of value for money beyond the sourcing process, considering benefits and risks to the organisation, the community, the economy and impacts on the environment.</p> <p>For example, Transport is currently preparing an Aboriginal Participation Plan, to assess how the proposal's spending requirements of the Aboriginal Participation in Construction can be targeted to maximise inclusion and value for Aboriginal communities in the Hunter. This involves an assessment of current Aboriginal businesses in the region and gaps in training and employment to meet expected requirements for the proposal and identification of potential strategies for improving/ increasing Aboriginal employment opportunities.</p> <p>The proposal would procure locally produced goods and services where feasible and cost effective.</p>

5. Environmental management measures

The following management measures, detailed in **Table 5.1**, have been developed to specifically manage potential impacts which have been predicted as a result of the proposed work. These measures should be incorporated into relevant Environmental Management Plans (EMPs) during construction and operations.

The environmental management measures should be read in conjunction with those outlined in:

- *Hexham Straight Widening Traffic and Transport Assessment (Jacobs, 2021i)*
- *Hexham Straight Widening Noise and Vibration Assessment (SLR, 2021)*
- *Hexham Straight Widening Biodiversity Assessment Report (Jacobs, 2021b)*
- *Hexham Straight Widening Surface Water and Groundwater Assessment (Jacobs, 2021h)*
- *Hexham Straight Widening Flooding and Hydrology Assessment (Jacobs, 2021e)*
- *Hexham Straight Widening Aboriginal Archaeological Survey Report (EMM, 2019)*
- *Hexham Straight Widening Aboriginal Cultural Values Assessment Report (EMM, 2021) Socio-Economic Assessment (Jacobs, 2021f)*
- *Hexham Straight Widening Urban Design, Landscape Character and Visual Impact Assessment (Tract, 2021)*
- *Hexham Straight Widening Phase 1 Soils and Contamination Assessment (Jacobs, 2020)*
- *Hexham Straight Widening Statement of Heritage Impact (Jacobs, 2021g)*
- *Hexham Straight Widening Coastal Processes Assessment (Jacobs, 2021d)*
- *Hexham Straight Widening Air Quality Assessment (Jacobs, 2021a)*
- *Hexham Straight Widening Climate Change Assessment (Jacobs, 2021c).*

Table 5.1 Environmental management measures

Impact	Management measure	Responsibility	Timing
Proposal sustainability outcomes	<p>A Sustainability Management Plan for the proposal will be developed and implemented during detailed design and construction, detailing measures to meet the proposal's sustainability objectives and targets. The sustainability management plan will:</p> <ul style="list-style-type: none"> ▪ Demonstrate leadership and commitments to sustainability ▪ Adopt relevant sustainability performance targets in accordance with the Transport sustainability strategy. ▪ Establish the roles, responsibilities and resourcing requirements ▪ Sustainable procurement measures to prioritise efficient use of resources and conservation of natural resources, and inform the proposal's sustainable procurement requirements from legislation, industry's policies/guidelines, and Transports' corporate requirements 	Transport/Contractor	Prior to construction and during construction

Impact	Management measure	Responsibility	Timing
	<ul style="list-style-type: none">▪ Document the process for the identification, assessment and implementation of sustainability initiatives and opportunities▪ Identifies sustainability training and awareness requirements▪ Document the process to be used to monitor and review of sustainability performance against achieving the proposal's sustainability targets▪ Outline the documentation and reporting requirements for sustainability on the proposal.		

6. Conclusion

This sustainability assessment has sought to satisfy the sustainability objectives for the proposal. It has done so by identifying the current NSW best practice guidance on sustainability in transport infrastructure projects. For the proposal, the most appropriate guidance was identified as the Roads and Maritime Services (2019) *Environmental Sustainability Strategy*.

6.1 Overview of sustainability impacts in the REF area

The review of the proposal against the sustainability focus area objectives of the *Environmental Sustainability Strategy* indicates that the REF area of the proposal, through the development of environmental management measures identified in this assessment and the proposal's other specialist assessments, is aligned with the strategy's sustainability objectives. The proposal also has either already satisfied Transport's proposal relevant compulsory sustainability requirements during the development of the proposal design or are placed to do so through detailed design and construction.

Through alignment with the *Environmental Sustainability Strategy* and with Transport's *Environment and Sustainability Policy*, the construction of the proposal is seeking to promote efficient use of natural resources where feasible and avoid waste spoil on the proposal in accordance with the desired performance outcomes for the proposal. The proposal's sustainability performance would be coordinated through the development and application of a Sustainability Management Plan.

6.2 Overview of sustainability impacts in the EIS area

Sustainability objectives relevant to the proposal largely relate to the larger REF area but relevant compulsory sustainability requirements have been incorporated into proposal elements in the smaller EIS area during the development of the design or would be incorporated during detailed design and construction. Sustainability impacts associated with the EIS area are anticipated to be minor.

6.3 Proposal summary

The proposal has been reviewed against the objectives of the *Environmental Sustainability Strategy*. It identifies that the proposal would meet these objectives through the implementation of the sustainability management measures developed for the proposal, and the complementary environmental management measures identified in the other proposal specialist assessments.

Finally, this assessment outlines an approach to managing sustainability on the proposal through detailed design, construction and operation through the creation of a comprehensive Sustainability Management Plan.

7. References

- EMM (2019), *Hexham Straight additional Capacity Upgrade Aboriginal Archaeological Survey Report*. Report for Transport for New South Wales.
- EMM (2021), *Aboriginal Cultural Values Assessment Report*. Prepared for EMM on behalf of Transport for New South Wales.
- Infrastructure Sustainability Council of Australia (2016), *Infrastructure Sustainability rating tool Version 1.2*.
- Jacobs (2020), *Hexham Straight Widening Phase 1 Soils and Contamination Assessment*, Report for Transport for New South Wales.
- Jacobs (2021a), *Hexham Straight Widening Air Quality Assessment*, Report for Transport for New South Wales.
- Jacobs (2021b), *Hexham Straight Widening Biodiversity Assessment Report*, Report for Transport for New South Wales.
- Jacobs (2021c), *Hexham Straight Widening Climate Change Assessment*, Report for Transport for New South Wales.
- Jacobs (2021d), *Hexham Straight Widening Coastal Processes Assessment*, Report for Transport for New South Wales.
- Jacobs (2021e), *Hexham Straight Widening Flooding and Hydrology Assessment*, Report for Transport for New South Wales.
- Jacobs (2021f), *Hexham Straight Widening Socio-economic Assessment*, Report for Transport for New South Wales.
- Jacobs (2021g), *Hexham Straight Widening Statement of Heritage Impact*, Report for Transport for New South Wales.
- Jacobs (2021h), *Hexham Straight Widening Surface Water and Groundwater Assessment*, Report for Transport for New South Wales.
- Jacobs (2021i), *Hexham Straight Widening Traffic and Transport Assessment*, Report for Transport for New South Wales.
- NSW Procurement (2018), *Aboriginal Participation in Construction (APIC) Policy, June 2018*. Department of Finance, Services and Innovation.
- NSW Office of Environment and Heritage (OEH) (2016), *NSW Climate Change Policy Framework*.
- NSW Office of Environment and Heritage (OEH) (2019), *NSW Government Resource Efficiency Policy*.
- NSW Environment Protection Authority (EPA) (2014), *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*.
- NSW Government (2017), *NSW Infrastructure Skills Legacy Program*.
- NSW Government, (2018), *Regional NSW Services and Infrastructure Plan*.
- NSW Government (2019a), *NSW Circular Economy Policy*.

NSW Government (2019b), *NSW Net Zero Plan Stage 1 2020-2030*.

NSW Government, (2020), *Small to Medium Enterprise and Regional Procurement Policy*.

NSW Government (2021). *NSW Government Procurement Policy Framework*

Roads and Maritime Services (2015), *Noise Mitigation Guideline*.

Roads and Maritime Services (2016), *Technical Guide: Management of Road Construction and Maintenance Wastes*.

Roads and Maritime Services (2019) *Roads and Maritime Services Environmental Sustainability Strategy 2019-2023*

Roads and Maritime Services (2020), *Beyond the Pavement*.

SLR (2021), *Hexham Straight Widening Noise and Vibration Assessment*, Report for Transport for New South Wales

Tract (2021), *Hexham Straight Widening Urban Design, Landscape Character and Visual Impact Assessment*, Report for Transport for New South Wales.

Transport for NSW (2018), *NSW Future Transport Strategy 2056*.

Transport for NSW (2020a), *Transport Environment and Sustainability Policy Framework and Statement*.

Transport for NSW (2020b), *Social Procurement Workforce Development Resource Guide*.

United Nations (2015), *United Nations Sustainable Development Goals*.

8. Acronyms

Acronym	Definition
CEMP	Construction environment management plan
CO2e	Carbon Dioxide equivalent
DPI	Department of Primary Industries
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
GREP	NSW Government Resource Efficiency Policy
ISLP	Infrastructure Skills Legacy Program
ISCA	Infrastructure Sustainability Council of Australia
LEP	Local Environment Plan
LGA	Local government area
NSW	New South Wales
PEI	Preliminary environmental investigation
POEO Act	<i>Protection of the Environment and Operations Act 1997</i>
REF	Review of environmental factors
SEPP	State Environmental Planning Policy
Transport	Transport for New South Wales