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Tonkin Gap Project and Associated Works: Annual Project Sustainability Report 2020-2021

Prepared by Tonkin Gap Alliance

This annual report covers the period from 1 July 2020 to 30 June 2021

For any queries, please contact the project via 138 138

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About this Report

This report has been prepared by the Tonkin Gap Alliance (TGA) on behalf of Main Roads Western Australia (Main Roads). This report forms part of Main Roads' annual sustainability reporting which is integrated into its Annual Report. The report content is prepared in accordance with GRI principles. Material topics reported in this report have been determined through a materiality process that adheres to Infrastructure Sustainability (IS) framework requirements.

Introduction

The Tonkin Gap Project and Associated Works is part of an infrastructure package announced in 2019 and is located approximately eight kilometres east of Perth, along Tonkin Highway. Connecting Gateway WA and NorthLink WA, this section of Tonkin Highway forms part of a vital freight and commuter access route known as the Perth to Darwin National Highway. Insufficient capacity to meet current demand at this location has created a 'bottleneck' that constrains the full realisation of the benefits from recent investments in Tonkin Highway and planned future investments to upgrade intersections and extend Tonkin Highway to the south. Congestion issues combined with the inadequacy of current cycling and pedestrian connections are having a negative impact on local amenity. Furthermore, the high proportion of merge, diverge and weave movements exacerbated by congestion are safety concerns and may lead to an increase in vehicle crashes.

Sustainability is a key focus for TGA that we have considered during the design and construction phase of the Project. TGA has prioritised sustainability due to the high impact that the infrastructure construction industry has in relation to environmental, social, local economic and governance factors. Our commitment to addressing sustainability issues including growth and economic benefit, efficient resource use, sustainable procurement, and community and stakeholder influence is reflected in the actions described within this report.

"The Alliance is committed to delivering a high-quality asset that will serve the community and local economies we are working within. We aim to challenge 'business as usual' practices which is in line with our project value, 'Let's be curious' by developing innovative strategies to work with our supply chain, local governments and our wider team of people to achieve our objectives. Sustainability has played an integral part in the development of internal processes and will continue to be at the forefront of our decision making as we work to deliver a connected, influential and sustainable piece of infrastructure." – Peter Hopfmueller, TGA Director

Highlights

Key highlights for the Tonkin Gap Project and Associated works include:

- $2.2 million spent on Aboriginal businesses of the targeted $10 million
- 91% of content procured from suppliers and businesses within Australia
- Minimizing impacts to the Swan River through the elimination of a temporary pier in the construction of the Redcliffe Bridge
- Stakeholder sentiment survey showing a positive average score of 8.5/10
- Reuse of onsite materials and use of recycled materials including 3,531 tonnes of crushed recycled concrete

Overview

The Tonkin Gap Project and Associated Works (the Project) is located approximately eight kilometres east of Perth, along Tonkin Highway between Collier Road, Bayswater and Dunreath Drive, Redcliffe (Figure 1). The Project aims to improve traffic flow and safety and enhance facilities for cyclists and pedestrians. The scope of the Tonkin Gap section includes new bridges at Dunstone Road, Guildford Road, Railway Parade and over the Swan River, increasing the number of lanes on Tonkin Highway and provision of noise walls and a new Principal Shared Path (PSP).

The Associated Works portion will deliver rail-enabling works for the METRONET Morley-Ellenbrook Line (MEL) along Tonkin Highway, which has also commenced construction works in 2021. Associated Works will include underpasses and dive structures, to enable trains to enter and travel along the median of Tonkin Highway then exit in Malaga. Road and bus bridges will be built at Broun Avenue to provide access to the future Morley Station. These works will help reduce impacts on Tonkin Highway when the main railway construction begins.

The $400 million Project, funded by the State and Federal Government, is being delivered by the Tonkin Gap Alliance (TGA) which is made up of five non-owner partners (NOPs); Georgiou, BMD, WA Limestone, GHD and BG&E. The Project is being fast tracked by Main Roads to help the WA Government drive economic recovery from the effects of COVID-19. The Project commenced detailed design in June 2020, with construction activities kicking off in November 2020. Detailed design was nearing completion through the first half of 2021, with construction expected to be complete in 2023.

The Project intersects with three local government areas; the City of Bayswater, the City of Swan and the City of Belmont. A full list of key stakeholders for the project and their relevance is included as Appendix 5.

Further information is available on the Project website:
https://www.mainroads.wa.gov.au/projects-initiatives/projects/metropolitan/tonkin-gap/

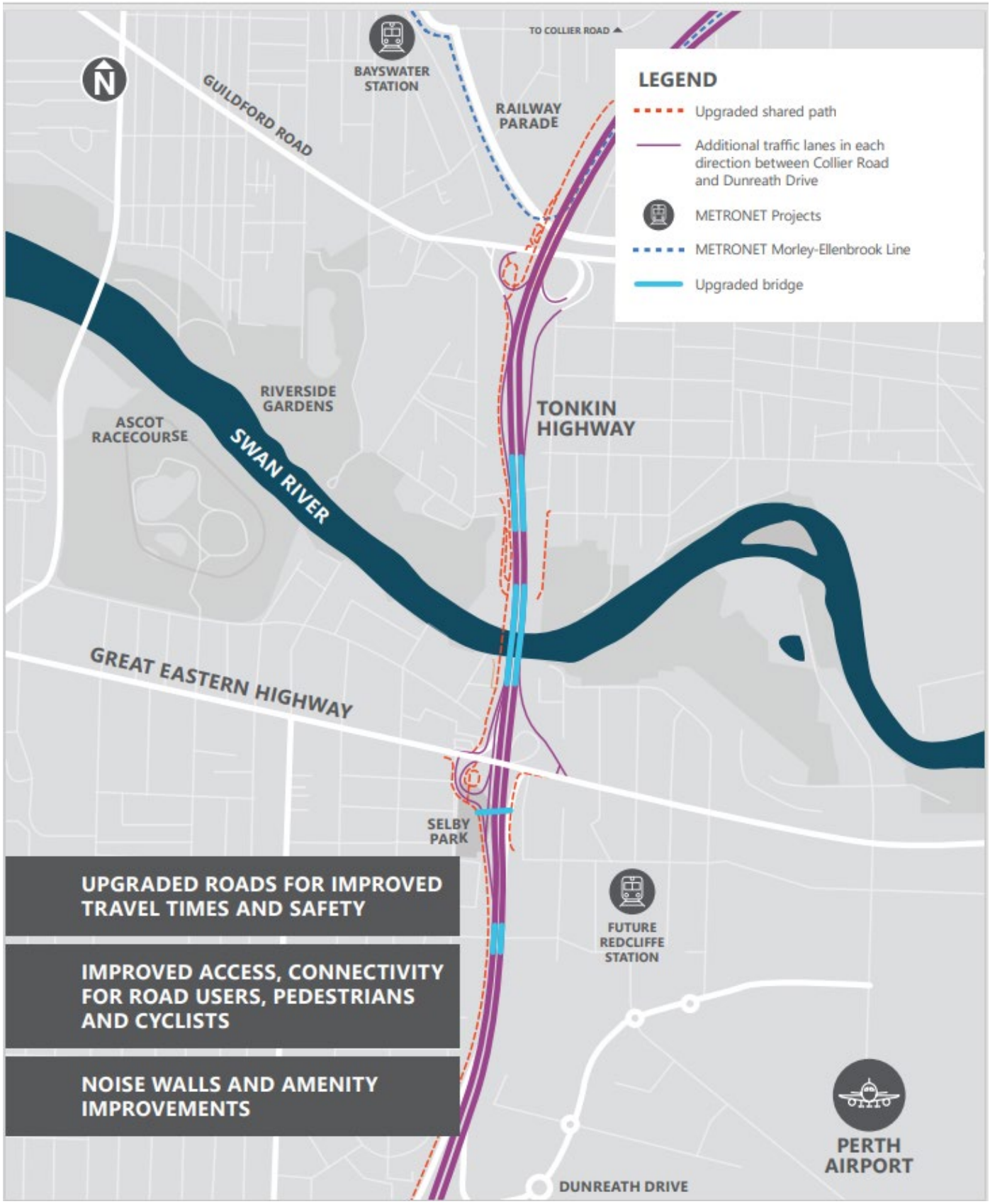

Figure 1 Tonkin Gap Project Map

Overall approach to Sustainability

Sustainability Policy Statement

TGA has developed a Sustainability Policy to guide the governance of the Project during design and construction. The Sustainability Policy has been endorsed by the TGA Director and is included as Appendix 1. The Policy is also available on the Main Roads website.

Sustainability Management

Sustainability on the Project is managed in accordance with the TGA's Sustainability Management Plan (SuMP) and is championed by TGA's Environment and Sustainability Team. The TGA Environment and Sustainability Manager works to ensure sustainability is discussed at the senior management team level. The TGA team is supported by a dedicated and experienced Sustainability Coordinator to help drive sustainable outcomes. There is a number of Infrastructure Sustainability Accredited Professionals in the Environment and Sustainability Team who have varying levels of experience in infrastructure sustainability working on the Project. The SuMP sets out the work to be undertaken for the Project during the Design and Construction phases to integrate and achieve sustainable outcomes.

Infrastructure Sustainability

TGA is committed to achieving positive sustainability outcomes across the Project. To demonstrate this, TGA is applying the Infrastructure Sustainability Council's (ISC) IS Rating Tool to the Project. The framework addresses a broad range of sustainability aspects on infrastructure projects across a range of credits, each with several requirements for which points are awarded. The relationship between these credits and the Project focus areas is outlined in Table 1. These consist of requirements relating to leadership and governance, procurement, environmental impacts, workforce development, stakeholder engagement and material and energy resources including waste. The Project is on track to achieving a score of 40 points using this framework, which will reward TGA with a Silver Rating from ISC

Material Sustainability Issues

We have used the United Nations' (UN) Sustainable Development Goals (SDG) to identify the material issues for the project. This process involved an internal multidisciplinary team mapping the possible impacts of and concerns with the Project against each of the SDGs, this mapping is included as Appendix 1.

The material issues are:

- Enhanced urban design and place-making
- Management and mitigation of impacts to water
- Efficient resource use and sourcing
- Industry prosperity
- Consultation and partnership

From these material sustainability issues on the Project the team has developed Sustainability Focus Areas. These focus areas help guide the identification of key risks and opportunities for the Project and are intended to inform the design and construction of the Project, particularly in adopting opportunities and decision making. The Sustainability Framework outlines the Project key objectives for each focus area. As demonstrated in the table below, several SDGs are quite similar and hence are grouped together, with others being relevant to more than one focus area.

From these objectives we have also identified Sustainability Targets to ensure sustainability is front

of mind during design, construction and operation. A summary of the Project progress in achieving these targets is included in Appendix 2.

Table 1 below outlines the relationship between the Project material sustainable development goals and the key focus areas as mentioned above, the table also provides context for why the focus areas were deemed material to the Project.

Table 1 Project Focus Areas and Objectives

Key Focus Areas	Objectives	Relevant SDG	Relevant IS credits
Enhanced Urban Design and Place-making	**Enhance the Swan River Crossing and surrounding area** The Swan River is an iconic feature in the Perth landscape and is a significant aspect of Indigenous and Perth heritage. The Swan River and its surrounds provides beneficial use to a variety of users. There are many stakeholders that will need to be consulted as part of the design and construction of the Redcliffe Bridge.		*Con-2* Urban and Landscape Design Context
	Maximise connectivity for multi-mode transport The design of Tonkin Gap and Associated Works must meet the needs of different transport users including road (passenger and freight), rail, cycling and pedestrians. It is essential for the upgraded bridge and alignment to consider and address all these needs in the final design.	 	*Con-2* Urban and Landscape Design Context *Ecn-1* Options Assessment
	Preserve and enhance ecological values Preserving and enhancing ecological value is an important aspect of the Project. This is significantly associated with the ecological value that the Swan River has for terrestrial and aquatic fauna and flora.		*Con-2* Urban and Landscape Design Context *Eco-1* Ecological Assessment and Risk Management
	Preserve and enhance heritage values Preserving and enhancing the Indigenous, natural and European heritage values is an important aspect of the Project. This is mainly attributed to the Swan River and surrounding precinct.		*Con-2* Urban and Landscape Design Context *Her-1* Heritage

Key Focus Areas	Objectives	Relevant SDG	Relevant IS credits
Management and Mitigation of Impacts to Water	**Optimise the design and groundwater interface** The design and groundwater interface represents a significant challenge for the Project due to existing contamination, presence of acid sulfate soils, the quantity of water required to be dewatered during construction, and the ongoing impact of groundwater on buried assets.		*Env-1* Receiving Water Quality
	Reduce impacts relating to groundwater contamination and acid sulfate soils Groundwater contamination and acid sulfate represent challenge in various locations along the alignment.		*Rso-2* Contamination and Remediation *Rso-3* Management of Acid Sulfate Soils *Wat-2* Utilising Appropriate Water Sources
	Minimise impacts and improve discharge quality to surface water The Swan River has the potential to be significantly impacted by the Project. As such minimising impacts and improving long term water discharge into the Swan River through sensitive urban water design is a key sub-focus area.		*Env-1* Receiving Water Quality
Efficient resource use and sourcing	**Optimised material selection and quantity** Infrastructure projects require significant quantities of materials to deliver. Appropriate selection and design optimisation can markedly contribute to minimise impacts to the environment and society.		*Rso-1* Resource Efficiency Strategy and Management *Rso-4* Resource Recovery
	Reduce energy requirements and emissions Infrastructure projects contribute a significant portion to Australia's and the world greenhouse gas emissions. Designing and delivering an energy efficient project is essential to		*Ene-1* Energy Efficiency

Key Focus Areas	Objectives	Relevant SDG	Relevant IS credits
	minimising global warming and reducing depletion of finite resources.		
	Reduce water requirements While a road project during operations does not consume significant quantities of water compared to other types of infrastructure, water consumption during construction is considerable. Minimisation through construction methodology is important to reducing the use of this precious resource in our drying climate.	  	*Wat-1* Avoiding Water Use
	Reduce waste and maximise onsite reuse and recycling Responsible stewardship of waste generated onsite is essential to improving environment and community outcomes.		*Rso-4* Resource Recovery
	Integration of offsite recycled products and materials The Project has opportunity to reduce use of virgin material through enhancing the integration of recycled material.		*Rso-1* Resource Efficiency Strategy and Management
Industry prosperity	**Improved workforce diversity and wellbeing** Enhancing workforce diversity has significant benefits to the wellbeing of the Project workforce and of our community.	 	*Wfs-2* Workforce Culture and Wellbeing *Wfs-3* Diversity and Inclusion
	Develop capability and capacity in subcontractors An opportunity to diversity and enhance businesses, particularly for large projects such as Tonkin Gap Project and Associated Works, is beneficial to improving resilience in the industry.		*Wfs-1* Jobs, Skills and Workforce Planning

Key Focus Areas	Objectives	Relevant SDG	Relevant IS credits
			
	Increased Aboriginal participation Aboriginal participation in the workforce is low compared to other community groups, and due to the size and nature of the projects, there is opportunity to enhance outcomes in this area.		*Wfs-1* Jobs, Skills and Workforce Planning *Wfs-3* Diversity and Inclusion
Consultation and Partnership	**Effective community engagement** Working with the community and meeting reasonable expectations during construction and operation are an important part of delivery of Tonkin Gap and Associated Works.		*Sta-1* Stakeholder Engagement Strategy *Sta-2* Stakeholder Engagement Strategy Implementation
	Improved outcomes for the Swan River and other key precincts through consultation Working with stakeholders and the community through targeted information and consultation events is a key priority for Tonkin Gap Project and Associated Works.		
	Effective decision making through collaboration with METRONET		

Key Focus Areas	Objectives	Relevant SDG	Relevant IS credits
	The linkage between the Associated Works and the MEL Project makes consultation with METRONET during design and construction an important aspect of the Project.		

Identifying and Investigating Sustainability Opportunities

The Project has taken a collaborative approach to achieve its sustainability objectives in the most impactful way. Numerous workshops and interactive sessions with multidisciplinary teams have been held to ensure sustainability is embedded through all aspects of design and construction. The TGA has hosted opportunity workshops that have instilled responsibility for sustainability in discipline leads, as well as their teams. We aim to create an inclusive culture where all people involved with the Project are provided with the chance to engage with the identification and implementation of sustainability related opportunities. To date, this has led to positive outcomes in alternative and low carbon concrete use (Case Study 1), partnerships with external organisations and reductions in waste production (Case Study 2.).

The photograph below (Figure 3) shows team members identifying opportunities using a map of the Project area. Approaches such as these have been successful in demonstrating the interconnectedness of sustainability issues to the wider Project team and how they apply to the whole Project.

Figure 2 Collaborative Opportunity Identification at TGA

Infrastructure sustainability rating current status

The Project submission for ISC's Design rating is progressing as expected at this stage in the Project. The Project is expecting to submit the Design rating submission in October 2021. The Project is adopting a combination of the V2.0 framework and several of the V2.1 credits that have been recently published in the new release of the technical manual, to target a 'Silver' rating.

Environmental Aspects Performance

At a glance

Aspect	Year to 30 June	Total for Project
Actual clearing to date (ha) (note this is native and non-native vegetation)	156	156
Rehabilitation/revegetation planned (ha)	0	Currently being designed
Total water consumption to date (kL)	50,725	50,725
Total water licence allowance (kL)	342,205	342,205
Total GHG emissions (scope 1, 2 & 3) to date (t CO_2-e)	844	844
Total energy consumption to date (MJ)	123,867	123,867
Total quantity of recycled content used in project (t)	95,799	95,799
Total imported materials used in project (t)	332,990	332,990
Total waste generated by project (t)	8,413	8,413

Environmental context

The Project is located primarily in a highly urbanised area of Perth, with surrounding environmental features that have been modified by historical human development. This includes neighbouring areas of residential and industrial land use. To the north of the Project is some undisturbed areas which contain some significant environmental features, such as the Threatened Ecological Community (see Appendix 5). The Project also crosses the Swan River, which although the banks have been modified in the past, supports the riverine flora and fauna.

The Project area includes a range of remnant native vegetation to areas which have been highly altered and disturbed. Three small sections of native vegetation were present adjacent to the existing Tonkin Highway near Dunreath Drive, Belmont; around Broun Avenue interchange, Bayswater; and on the shoreline of the Swan River. The largest section of native vegetation which the Project falls within is at the most northern extent. This section is where TGA will construct the dive structure which will enable the rail line to run underneath the road and continue to travel to the east of Tonkin Highway. Each of these native vegetation areas have been approved for clearing under the *Environmental Protection Act 1986* and associated regulations, some with offset requirements incorporated within the approval conditions. Other existing vegetation across the Project consists of weeds and non-native species, as well as roadside revegetation with native species to Western Australia.

Appendix 4 provides a list of protected fauna and flora species and habitats within or in close proximity to the Project.

In areas of the Project the ground has been significantly altered, and in some instances existing ground contamination is present and is managed as part of construction works. This includes random fly-tipping of inert waste, as well as contamination from historical industry use of the land prior to the original Tonkin Highway being constructed. This management is being undertaken by TGA under review of an independent Contaminated Sites Auditor.

Legislative requirements

The key environmental legislation impacting the Project include:

Commonwealth Government

- *Aboriginal and Torres Strait Island Heritage Protection Act 1984*
- *Aboriginal and Torres Strait Island Heritage Protection Regulations 1984*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Protection and Biodiversity Conservation Regulations 2000*
- *National Environmental Protection Council Act 1994*
- *National Greenhouse and Energy Reporting Act 2007*

State Government

- *Aboriginal Heritage Act 1972*
- *Biodiversity Conservation Act 2016*
- *Biodiversity Conservation Regulations 2018*
- *Contaminated Sites Act 2003*
- *Environmental Protection Act 1986*
- *Environmental Protection Regulations 1987*
- *Environmental Protection (Noise Regulations) 1997*
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- *Environmental Protection (Controlled Waste) Regulations 2004*
- *Environmental Protection (Unauthorised Discharges) Regulations 2004*
- *Heritage Act 2018*
- *Rights in Water and Irrigation Act 1914*
- *Swan and Canning Rivers Management Act 2006*

Environmental Management

A project specific Environmental Management Plan (EMP) provides a framework for the management of all environmental aspects associated with the construction of the Project.

The primary purpose of the EMP is to describe the management systems and procedures, which will be adhered to in achieving Project environmental objectives and goals. The EMP is the overarching reference for environmental management throughout the construction phase. The EMP prescribes all applicable procedures, processes, and practices to be undertaken by TGA and their subcontractors. The EMP outlines processes to manage environmental risks, effectively minimise impacts on the surrounding environment, and ensure compliance with regulatory and other obligations throughout project delivery.

The Tonkin Gap Project and Associated Works EMP, its sub-plans and procedures are applicable to all project works, staff, and subcontractors during construction. Sub-plans include the Fauna Management Plan to ensure risks to ecosystem health and native fauna are minimised during construction. Fauna trapping and translocation was undertaken to mitigate impacts to fauna, Figure 4 shows a trap line consisting of fauna fence and pitfall and funnel traps.

Figure 3 Fauna Trapping

Additionally, where works have a high risk of creating unnecessary environmental impacts, specific Environmental Management Plans have been developed to manage these risks. For example, works at and surrounding the Swan River have a specific EMP which has been reviewed and approved by the Department of Biodiversity, Conservation and Attractions (DBCA).

TGA utilises the BMD Group Environmental Management System (EMS), accredited to the ISO 14001 Standard.

Environmental Protection Authority assessment

Mains Roads referred the Project to the WA Environmental Protection Authority (EPA) for determination under Section 39a (7) of the *Environmental Protection Act 1986* (EP Act). The Tonkin Gap portion of the Project was determined to not require assessment by the EPA.

The Public Transport Authority (PTA) referred the Bayswater to Malaga Rail Works (the first stage of the Morley – Ellenbrook Line Project) to the EPA for determination under Section 39a (7) of the EP Act. This proposal covered the rail enabling works within the Tonkin Highway road-reserve between Bayswater and Malaga. This stage of the MEL Project was determined to not require assessment by the EPA in December 2019.

The Malaga to Ellenbrook Rail Works (stage two of the MEL Project) was formally assessed by the

EPA with approval, subject to conditions, granted early 2021. The Associated Works component of the Project overlaps the MEL Project, therefore the conditions in the MEL Project Stage 2 Ministerial Statement are applicable to the part of the Associated Works component of this Project.

Water management

Water is a material aspect of the Project due to the intersection with the Swan River and groundwater sources. A water sourcing assessment was undertaken, and several opportunities identified to reduce or improve the efficiency of water use on the Project. These are summarised below. Given the urban nature of the site, groundwater is typically only accessed by local governments and private residences by backyard bores (in addition to industrial uses). It is recognised that any groundwater abstraction is minimised to reduce the risk of impacts to existing groundwater users who rely on this water. As part of mitigating this risk, our groundwater abstraction points are approved by the Department of Water and Environment Regulation (DWER) under the *Rights in Water Irrigation Act 1917*. Key water saving initiatives that have been implemented include:

- Reuse of water from the dewatering process for construction purposes such as dust suppression
- internal clearing permit process reduced the occurrence of early or unnecessary clearing of vegetation, in turn reducing the need for dust suppression reducing water requirements

Source	Year to 30 June	Total for Project
Water purchased from the scheme (kL)	3,534	3,534
Water pumped from bores (kL)	50,725	50,725

The Project also has the potential to adversely impact the Swan River, however through careful construction planning and environmental management, impacts should be minimal. Some examples include:

- The use of 'coffer dams' which have sheet piled walls to stop sand and other material from the works area entering the river and removing the need for a temporary pier within the river during the installation of the bridge.
- Regular monitoring of water quality surrounding site works (Figure 5).

Figure 4 Monitoring water quality at the Swan River

Carbon emissions and energy

The construction phase of a major road project requires a significant amount of energy use. As a result carbon emissions and energy use has been identified as a material issue for the Project. Reducing the overall energy use incurred during construction and operation is a priority for the Project due to the significant contribution the construction industry has to greenhouse gas emissions in Australia.

Measuring carbon emissions and energy use during construction considers:

- emissions required to produce and deliver construction materials (embodied energy)
- fuel use by construction plant, vehicles and equipment
- electricity consumption at offices and on-site and lighting to aid construction works.

Initiatives to reduce the overall emissions from the Project have been investigated during design and are ongoing throughout the construction phase. The following initiatives have been investigated and planned for implementation into the projects design and/or construction methods to reduce the quantity of materials needed for the Project with high embodied energy.

- Plans to make use of crushed recycled concrete (CRC) as road base or fill material.
- The adoption of LED Lighting on Redcliffe Bridge to reduce energy consumption once the project is complete.
- Change in design and construction methodology which has led to the removal of a temporary pier in the river (for the construction of Redcliffe Bridge), reducing fuel from plant and materials required for its installation

Energy usage by source in mega joules	Year to 30 June	Total for Project
From fuel use (MJ)	10,966	10,966
From electricity (MJ)	12,3867	12,3867

Materials and recycling

Material use and resource efficiency is a material issue for the Project due to the high quantities of construction materials required. The Project Resource Efficiency Strategy objectives align with the wider regional strategy of the East Metropolitan Regional Council (EMRC)[1] and the WA Government's Waste Minimisation Strategy.[2] Resource Efficiency targets are included in the overall Project Sustainability targets. The Project internally tracks resource inputs and outputs for monthly reporting to Main Roads and to measure modelled and actual impacts.

Figure 5 Redcliffe Bridge Casting Yard

The Project will use significant volumes of materials including concrete, sand and fill material, steel, crushed limestone, and aggregate. Major outputs for the Project include demolition waste, steel, contaminated soil, asphalt, and general waste. The Project has adopted initiatives that reflect best practice applications to reduce the quantity of virgin materials, remove outputs from waste streams and recycle materials where possible. These initiatives contain combinations of circular economy, industrial ecology, industrial symbiosis, cleaner production, and resource recovery concepts.

The following initiatives have been adopted onto the Project:

- cut to fill optimisation to reduce import of fill materials
- use of imported embankment material from another Main Roads project
- industry engagement to source materials with lower carbon or higher recycled content

[1]https://www.emrc.org.au/Profiles/emrc/Assets/ClientData/Documents/Page_Content/Environmental_Services/Regional-Environment-Strategy-2016-2020.pdf

[2]https://www.wasteauthority.wa.gov.au/images/resources/files/Strategic_Direction_Waste_Avoidance_and_Resource_Recovery_Strategy_2030.pdf

Material and Waste Statistics

Imported Materials	Year to 30 June	Total for Project
Sand (t)	80,727	80,727
Limestone (including crushed) (t)	119,420	119,420
Crushed rock (t)	8,788	8,788
Crusher dust (t)	45	45
Aggregate (t)	101	101
Asphalt (t)	90	90
Concrete (t)	9,280	9,280
Steel (t)	940	940

Waste to Landfill	Year to 30 June	Total for Project
Roadside litter / municipal solid waste (t)	40	40
Green waste (t)	260	260
Construction / demolition waste (t)	11	11
Contaminated material (t)	734	734
Asbestos (t)	224	224
Waste Recycled		
Sand (t)	146	146
Asphalt (t)	36	36
Timber (t)	22	22
General waste (site office / roadside litter) (t)	0.1	0.1
Steel (t)	98	98
Concrete (t)	5,356	5,356
Construction demolition (t)	1,480	1,480

Imported recycled content	Year to 30 June	Total for Project
Sand (t)	87,586	87,586
Road base (t)	3,932	3,932
Crushed recycled concrete (t)	3,531	3,531

Case Study 1: Wotton Reserve Shared Path

Concrete is one of the more carbon intensive materials used in construction and given the large quantities required, the carbon footprint is significant. To reduce the Project footprint associated with the use of construction materials, we are trialling a new, lower carbon concrete mix from Holcim. Through engagement with the supplier, and our committed site engineers, the Project has constructed the temporary shared path at Wotton Reserve (Figure 7) with ECOPact Plus, a concrete mix containing recycled aggregates to minimise associated emissions.

Application at Wotton Reserve saw 57 m^3 of ECOPact concrete mix used, resulting in a reduction of 11,457 kg CO_2-e, equivalent to the energy use of 1.4 family homes for one year.

Figure 6 Wotton Reserve EcoPact Plus Concrete Pour

Case Study 2: Single-use Paper Cups

The Project has several compound offices located across the extent of the construction site. Each site can have anywhere between 15-100 people utilising the facilities on a day-to-day basis, which translates to a lot of waste. Passionate members of the Commercial team identified an opportunity to significantly minimise the waste coming from site offices, when they realised the Project was using approximately 4,000 paper cups a month, equivalent to around 147 kg CO_2-e. To tackle this waste stream, the Project has now provided all site workers with a re-usable TGA branded water bottle and keep-cup (Figure 8).

This initiative will remove more than 100,000 paper cups from going to landfill during construction. This contributes a saving of at least 3,684 kg CO_2-e, which is equivalent to emissions associated with one passenger vehicle for a year.

Figure 7 TGA Team members with re-useable bottles and cups

Noise and vibration

Construction noise is managed within the EMP's Noise and Vibration Management Sub-plan. The plan outlines mitigation measures for noise and vibration during construction. Residents are notified of upcoming construction works that may cause noise and vibratory disturbances through letter drops to impacted areas, the Project social media channels and the Main Roads website.

The Environmental and Stakeholder Engagement teams work together to mitigate impacts to residents and the environment from noise and vibration produced during construction activities. Construction activities to be completed outside of regular operation hours, including night works (Figure 9) are undertaken in accordance with the Out of Hours construction management plans that have been developed for each of the relevant Local Government Authorities. The teams use monitoring equipment to confirm noise level limits are not exceeded and ensuring it is conducive with the Project anticipated levels.

Extensive noise modelling was undertaken to determine mitigation measures needed to manage noise after completion of the Project. The Project will construct noise walls in locations where noise from the road would have exceeded acceptable levels for human comfort,

Dust, air quality and light

Measures to mitigate impacts from other emission sources including dust and light are managed through the Project Environmental Management Plan. During construction the key management measure for minimising dust is the use of water carts and staged clearing of vegetation to reduce exposed areas. Temporary lighting is being used during nightworks for safety reasons and light spill will be controlled as much as possible through lighting tower positioning and construction methodology.

Figure 8 Night works

Clearing

The local community highly valued the vegetation in or around the Project, particularly at the Swan River foreshore and recreational areas. Subsequently, the Project team aimed to minimise clearing as much as possible. The Project team developed an internal clearing permit that requires applicants to gain approval internally before starting any clearing activities. The process involves inspection walks of the proposed clearing area by the TGA Environment Team to mark the smallest possible area to be cleared and identify any trees of significant importance to be saved. The Project team's internal clearing process resulted in positive outcomes for the community and the Project. The Project was able to accommodate the preservation of numerous trees of importance to the community.

Contaminated sites and acid sulfate soils

The Project includes a contaminated site which is from historical use of the road reserve and the neighbouring land for fertiliser production that began in 1928. The site, located just north of Railway Parade, is where the first dive structure is to be constructed enabling the new rail line to travel under the existing road and into the median to continue its journey north. Remediation works have been undertaken for the land adjacent to the road to help clean up this historical issue, however access to Tonkin Highway has been difficult in. Investigations have been completed to find out how much contaminated material is left and where excavation works need to occur.

Across the Project acid sulfate soils (ASS) naturally exist in the sand and soils under the surface. When exposed to air this can increase the acidity of the soils and any water present. TGA has an ASS Management Plan in place to mitigate this risk during the numerous excavations across the Project.

Dieback and spills

Dieback is a key threatening process for biodiversity of south-west Western Australia. The potential risks of transport of dieback through contaminated plant, equipment and materials are managed by the Project through the Weed and Dieback Sub-plan. There is known dieback to the north of the Project, where clearing is to be undertaken for the construction of MEL's northern dive structure. Risks associated with the clearing of affected vegetation will be mitigated through several control measures including vehicle and plant cleaning prior to arriving and leaving sites and on-going record keeping of weed and dieback inspections.

Spills of oil, fuel or chemical substances are managed under the Project Chemical Substances Sub-plan. Emergency response plans are detailed within the Project EMP for major incidences. To date, the Project has not experienced any major incidences.

Case Study 3: Casuarina Trees Retained Through Design Change

A number of trees along Tonkin Highway near the junction of River Road and Kenmure Avenue in Bayswater were initially set to be cleared for the construction of drainage infrastructure. Through a pre-clearing site walkthrough, which is part of the Project internal clearing permit process, several Casuarina and Eucalypt trees were flagged for preservation and the clearing area minimised through re-design. Following completion of the construction of the path, a Bayswater resident sent through some photos of a flock of Carnaby's Black Cockatoos feeding in the treetops of the saved trees.

Figure 9 Carnaby's Black Cockatoo feeding on retained treetops

Economic Aspects Performance

At a glance

Economic Aspect	Year to 30 June	Total for Project
Funding	$400 million	$400 million
No. of vehicles per day	120,000	120,000
Travel time saving	6-11 minutes*	
Increase of vehicle capacity	TBC	
Increase in cycling and pedestrian facilities	TBC	
Workforce and supply chain		
Number of people employed by supply chain at various stages of project	174	174
Total number of suppliers engaged	140	140
Total number of Indigenous enterprises	9	9
Total number of disability enterprises	0	0
Buy local spend (to date)	91%	91%

*dependent on varying peak times such are morning and afternoon.

Economic context

Industry prosperity is a material issue for the Project due to its significant size and its capacity to impact local economies. Tonkin Highway is at the centre of several major road projects to improve connectivity and network operations in the region, with the road carrying more than 120,000 vehicles a day. Connecting the now completed Gateway WA and NorthLink WA, this section of Tonkin Highway forms part of a vital freight and commuter access route for Western Australia. Insufficient capacity to meet current demand at this location has created a 'bottleneck' that constrains the full realisation of the benefits from recent investments in Tonkin Highway and planned future investments to upgrade intersections and extend Tonkin Highway to the south.

Figure 10 Event representatives from Main Roads, Civil Contractors Federation, and the Tonkin Gap Alliance

Key economic outcomes

The Project will transform Tonkin Highway to deliver a high standard, north-south transport link from Muchea to Mundijong. The upgrades are expected to save road users up to six minutes of travel time during morning peak and up to 11 minutes of travel time during afternoon peak.
The Project has been fast tracked as a part of the State Governments $5.5 billion COVID-19 WA Recovery Plan. The Plan prioritises major road and rail project across the state to connect suburbs, reduce congestion, support local jobs and bolster our economic recovery.

The key economic outcomes for the Project include:

- improving travel times and the productivity of one of Perth's major freight routes
- reducing congestion and the high proportion of merge, diverge and weave movements that are leading to an increase in concern for the safety of road users
- improving current cycling and pedestrian connections to increase local amenity
- providing infrastructure to support the delivery of METRONET's Morley-Ellenbrook Line.

The road safety improvements that will result from the construction of the Project include reducing congestion which has contributed to the Tonkin Highway and Collier Road intersection being rated as the worst in the state for vehicles crash frequency and cost between 2011-2015. This cost, totalling $15.8 million for the period, will be significantly reduced with the road development. Additionally, the $194.2 million cost of congestion and the $19.6 million cost to the environment through air pollution and emissions are expected to be reduced on Project completion.

Sustainable procurement and buy local

TGA's procurement processes are mediated by the team's Sustainable Procurement Policy, the

Commercial Management Plan, and the Industry Sustainability Plan. Several of the Project sustainability targets are related to Industry Sustainability and Sustainable Procurement. Each plan and policy aligns with the WA government's industry sustainability and participation strategies. These include the WA Buy Local Policy, WA Industry Participation Strategy (WAIPS) and the Aboriginal Procurement Policy (APP).

The targets for Industry Sustainability are included in the overall Sustainability Targets for the Project. The Project team is committed to ensuring all aspects of sustainability are considered in the procurement process and the Sustainable Procurement Policy is available on the Main Roads Project website.

In the early stages of the alliance, TGA partnered with Civil Contractors Federation (CCF) to engage with the wider market in preparation for the procurement of packages on the Project. This was done in two separate sessions, one which was targeted at CCF signatories and one targeted at Aboriginal businesses. The sessions communicated the Project' commitment to sustainable procurement, tender evaluation processes and types of packages.

Climate change assessments

A Climate Change and Natural Hazard (CCNH) risk assessment was undertaken involving representatives from the TGA design, environment and community teams, as well as key stakeholders from Main Roads, PTA, the impacted Local Government Areas and Perth Airport. The risk assessment used the Representative Concentration Pathway (RCP) 8.5 modelled scenario to quantify climate predictions for the years 2030, 2050 and 2090. RCP scenarios adopted by the Intergovernmental Panel on Climate Change (IPCC) simulate both future energy technologies and emissions. The pathways produce emissions scenarios that are then used by scientists to run complex climate models that simulate how the climate might change in the future.

The Project adopted RCP 8.5 as it is the more conservative approach with the intention to protect the constructed project physically and its users throughout its 100-year lifetime. Two high priority risks were identified that related to increases in extreme weather, including increased frequency and intensity of bushfires and flooding. To minimise risk of aquaplaning from rainfall events the geometry of the road and pavement type was assessed. Risks associated with bushfire events were mitigated through review of landscaping species selection and the size of mulch was increased in fire prone areas. As these risks required management, treatment plans were developed with management measures to reduce the risks to the Project and its future users.

Sustainable transport

The widening of Tonkin Highway will significantly reduce congestion and the stop and start motions of this part of network. Carbon emissions emitted from idling vehicles are expected to reduce. The Project will also provide improved principle shared path (PSP) and cycling connections encouraging the use of active transport modes.

The Project has undertaken a self-assessed permeability assessment to define expected improvements in connectivity and placemaking. The assessment sought to define a baseline of the existing network and quantify the improvements that would result from the construction of the Project. The assessment took into consideration walking and cycling connectivity, journey time reliability, access to cycleways, integration of culture and heritage, and the provision and improvement of public spaces and stop-and-rest areas.

The Project is improving upon baseline permeability through the reconnection of nature walks in Claughton Reserve, the provision of rest stops on shared path networks and the optimising of

connection points for walk and cycle crossings along Tonkin Highway. The Project is expecting to improve upon the baseline of the network in all the stated areas.

Future proofing of the Project has been considered in the provision of these aspects of sustainable transport and additionally through the Associated Works package providing key infrastructure and services to METRONET's Morley-Ellenbrook Line (MEL). The MEL will provide an alternative travel option to Perth's highest car usage corridor, anticipating an increase in the adoption of public transport use among Perth's population. This package is also expected to contribute to reducing vehicle emissions caused by the high level of car use due to limited alternative transport options.

Technology and innovation

The Project has endeavoured to pursue opportunities to include innovative construction methodologies and materials by incorporating new technologies to improve outcomes. Ongoing engagement with industry and other Main Roads and PTA projects will continue to share sustainability knowledge, lessons learnt and drive improved outcomes in innovative technologies.

As described in Case Study 1, the Project has pursued the use of materials with a lower carbon footprint to reduce its overall emissions. This and other similar opportunities are being explored throughout construction with the intention of seeking innovative products and technologies to reduce the carbon footprint and waste production of the Project.

Social Aspects Performance

At a glance

Social Aspect	Year to 30 June	Total for Project
Community satisfaction to project	76%	76%
No. of stakeholders engaged with during project development	1500	1500
No. of complaints	160	160
No. of heritage sites in project vicinity	2	2
No. of traffic safety incidents within project boundary	39	39
% of women in workforce	7.23%	7.23%
% Indigenous in workforce	7.15%	7.15%
No. of development employees and apprentices on the project	10	10

Social context

The Project runs across three local government areas, the Cities of Belmont, Bayswater, and Swan.

The City of Belmont is located 6 km from Perth's central business district, along 11 km of Swan River frontage. The City is a mix of residential, commercial, and light industrial properties and includes (within its boundaries) part of the Perth Airport. The City has a population of more than 60,000 people, with approximately 40 per cent of the population born overseas and 30 per cent of the population speaking a non-English language at home[3]. The 2016 Census determined that more than 72 per cent of residents travel by car as a driver or passenger to their places of work. The City of Belmont connects to the City of Bayswater via Redcliffe Bridge on Tonkin Highway (Figure 12) across the Derbal Yerrigan (Swan River).

Known as the "Garden City", the City of Bayswater covers 35 sq/km just 8 km northeast of Perth with 10 km of Swan River foreshore. Many parks and conservation areas within the City support abundant bird and other wildlife. The city has a population of more than 65,000, of which at least 45 per cent were born overseas[4] and 69 per cent predominately travel by car as a driver or passenger to their places of employment[4].

The City of Swan has almost 156,000 residents living in approximately 60,000 dwellings across 42 suburbs[5]. The City is made up of 74,200 employed residents, more than 10,000 actively trading businesses, 67,800 local jobs and a gross regional product of $9.95 billion. A small portion of the most northern section of the Project intersects with the City of Swan.

A new financial impact index[6] released in June 2020 stated that Belmont was one of the 10 worst hit suburbs financially due to COVID-19. Several suburbs within the City of Bayswater were also impacted highly.

The Project is on Whadjuk Noongar Country and intersects with Derbal Yerrigan (the Swan River), a site of significance in local Aboriginal culture. The Project has considered the social and heritage

[3] 2016 Census QuickStats: Belmont (WA) (abs.gov.au)
[4] 2016 Census QuickStats: Bayswater (C) (abs.gov.au)
[5] 2016 Census QuickStats: Swan (C) (abs.gov.au)
[6] COVID-19 Financial Impact Index - Taylor Fry

context of the Project when approaching its social and community aspects.

Figure 11 Redcliffe Bridge linking the Cities of Bayswater and Belmont via the Tonkin Highway across the Derbal Yerrigan. This bridge will be widened as part of this Project.

Community and stakeholder engagement

The Project identified a comprehensive list of relevant community stakeholders. Community and stakeholder engagement for the Project is delivered in accordance with TGA's Community and Stakeholder Engagement Plan (CSEP). TGA has prioritised the delivery of targeted and inclusive engagement to ensure the views of all demographics are represented in relation to the Project. A comprehensive list of relevant stakeholders is included as Appendix 5.

Several working groups provide input on various aspects of the design and delivery. These groups have been consulted to inform the traffic detours, PSP and cycling lane design and development, improvements to amenities and to voice concerns regarding environmental and ecological impacts. Engagement with Whadjuk Noongar Aboriginal people has taken place through the establishment of a Traditional Owner Advisory Group (TOAG). The TOAG has provided advice and oversight of TGA's progress towards Aboriginal participation targets, while also providing input into detailed engagement for relevant aspects of the projects, such as the activation of community spaces under Redcliffe Bridge.

This comprehensive stakeholder engagement has resulted in positive responses to stakeholder and community sentiment surveys, which permitted the Project team to achieve its Sustainability targets for effective community engagement for the Design phase of the Project.

Addressing community concerns

The Project uses the Main Roads CONNECT system to record community interactions. The Project

has identified several key aspects that the community should be consulted on. This includes the development of amenities under Redcliffe Bridge, design aspects of noise and screen walls, and aspects of the re-development of Selby Park.

A key outcome of community engagement was design changes to include noise walls on Redcliffe Bridge. Initial designs of Redcliffe Bridge did not include noise walls and community concerns were raised regarding the impacts this may have to amenity and ecology in the area. Subsequently, the Project team made design updates to include the noise walls at the approval of Minister for Transport Rita Saffioti. This resulted in positive community sentiment for the Project and addressed the concerns of residents regarding the traffic noise.

Heritage

TGA recognises that the Whadjuk community are the Traditional Owners of the land and their cultural and spiritual connection to the land grants them an entitlement to be actively engaged in the Project. Reconciliation is a key step towards closing the gaps between Aboriginal People and non-Aboriginal People.

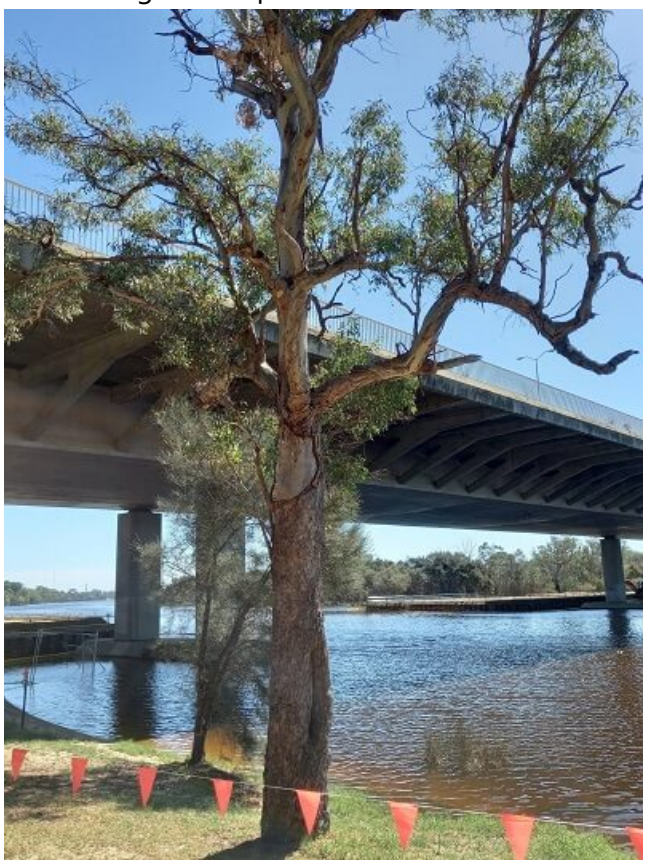

Figure 12 River Gum tree with cultural scar on the bank of the Swan River

For this Project, TGA conducted a heritage survey, and two sites of cultural significance were identified within the works area:

- the Derbarl Yerrigan (Swan River)
- two River Gum trees each with a single cultural scar (Figure 13).

The Derbarl Yerrigan is said to have been created by the Waugyl, a spiritual being often described as a serpent or snake, who still resides in the river systems. It represents cultural continuity and is incorporated in many language groups oral histories.

Scar Trees are the result of removing parts of the tree to make objects - which later become artefacts representing the traditional knowledge of the Whadjuk people. This provides an indication to the ancestral occupation and use of the area's resources.

TGA aims to avoid, minimise, and reduce negative impacts to Aboriginal heritage sites wherever practicable, in line with Main Roads' commitment to recognising Aboriginal heritage. The management of cultural heritage is delivered in accordance with the Project EMP's Cultural Heritage Management Sub-plan. In addition to this management the Project team is informed and educated about the sites and their significance through the Project site induction presentation. TGA also requires the presence of heritage monitors during any works that may disturb the sites as appointed by the South-West Aboriginal Land and Sea Council (SWALSC).

The Project team has engaged in milestone cultural ceremonies including a smoking ceremony

held November 2020 facilitated by Whadjuk Elder Trevor Walley (Figure 14).


Figure 13 Smoking Ceremony facilitated by local Elder Trevor Walley

Road and community safety

The intersection of Tonkin Highway and Collier Road was rated as Perth's worst intersection for crash frequency in metropolitan Perth. From 2011 – 2015, 341 incidents were recorded at this intersection. The stop-start traffic conditions and weaving movements are resulting in a disproportionate number of crashes occurring on this section of road. A key objective of the Project is to reduce the number of weave, diverge and merge motions on the stretch of road that are exacerbated by congestion by equipping the road section to accommodate growing vehicle volumes. Community safety has been considered throughout the Project design and construction. Crime Prevention Through Environmental Design (CPTED) has been considered throughout the design of path, noise wall and road alignments, lighting designs and urban and landscape design.

Community amenity

The Project has aimed to improve local amenity through the integration of active and sustainable transport infrastructure into the design. This is reflected in its Sustainability targets which include objectives to maximise connectivity for multi-mode transport. Suggestions from stakeholders and the community to improve the existing amenity under Redcliffe Bridge have included a bike track, native vegetation planting, artwork, fishing platforms and shared path facilities. Further consultation is planned, and outcomes will be shared with local government, stakeholders, and the community.

The Sustainable Transport section of this report addresses the permeability assessment undertaken for the Project. In addition to those opportunities pursued in relation to connectivity, the Project also aims to improve community amenity. These include the provision of increased rest stops along the shared path network and the realignment of pedestrian crossings along Tonkin Highway to optimise accessibility to local primary schools and for users of Selby Park. The Project is also pursuing an interpretive heritage trail that will provide educational signage and artwork to reflect local cultural heritage.

Diversity, inclusion and workforce development

The TGA is committed to developing and maintaining a positive, supportive, and inclusive organisational culture throughout the life of the project. Workforce sustainability and employee development is a key component of this that helps ensure appropriate workforce capacity and capability. TGA has developed comprehensive programs to develop and support the team. The

Project Employee Development Plan encompasses TGA culture, well-being programs and actions to promote diversity and inclusion in the workplace. This has been achieved through several programs including the celebration and recognition of important dates and events that promote inclusion. TGA has also engaged external organisations to deliver training sessions for the entire Project team on topics of inclusion and diversity and cultural awareness.

The sustainability framework includes objectives to improve workforce diversity and well-being and increase Aboriginal and female participation. Additionally, targets aimed at recruiting and retaining new entrants in the industry will see targeted programs and mentoring provided to younger team members. The Project targets for inclusion and diversity include the following:

- 10% of the workforce representing women
- engage 30 Aboriginal full-time equivalent employees for the duration of the Project
- 10% of the workforce to representing new entrants to workforce

The Project team conducts a culture and well-being survey every 3-months to gauge an understanding of workforce sentiment towards the Project team and its culture. The first survey was conducted March 2021 and received a 75 per cent response rate. The result of the survey showed positive levels of trust and safety among the team and 87 per cent of the team is satisfied working as part of the TGA.

To aid in setting goals, allowing growth and the development of professional careers as well as driving better Project outcomes, TGA has developed professional development plans for all TGA employees. The plans are an opportunity for employees and their managers to review their performance and identify any areas for improvement. The plans also provide an opportunity for employees to reflect on their professional development goals to be pursued beyond their time working on the Project. The plan has been developed by reviewing the best practices from all constructor partners and is reflective of the Project core values.

Workforce safety

Workforce safety is a priority for TGA, with KPI's assigned to safety performance on the Project. In the past financial year more than 340,000 hours were worked on the Project resulting in only 5 recordable injuries. Thirty-nine traffic safety incidents occurred within the Project boundary, however the vast majority of these incidents were incidences of external traffic and/or theft and vandalism.

Case Study 4: Nudge Engineering Traineeship

The Nudge Foundation is a not-for-profit organisation that helps projects like the Tonkin Gap Project get young people into jobs and provide training opportunities with long term benefits. The Nudge Foundation will provide tailored mentoring for TGA's Aboriginal employees during their time on the Project, and beyond as they transition into other roles or projects.

Additionally, in a pioneering move to help upskill our subcontractors and help forge more opportunities for young Aboriginal people, Nudge and TGA have developed an Engineering Traineeship Program for candidates interested in civil construction operations and design.

The traineeship will cover areas of design and construction, with AutoCAD training and learning modules such as calculating stress in structures, reading and interpreting drawings, and process planning. The role will be a great support the team and include very transferrable skills and experience for the trainee. The Project is expecting its first trainee to start in September, with further opportunities being offered throughout construction. The mentoring programs and traineeships are expected to result in sustainable employment outcomes by providing clear pathways and support to young Aboriginal people.

Figure 14 TGA representatives and subcontractors at a Nudge Mentoring and Traineeship information event

Appendix 1 – Sustainability Policy

Tonkin Gap Alliance

SUSTAINABILITY POLICY

This policy applies to the Tonkin Gap Alliance and has been developed from the parent companies' policies. For ease of reference, the term 'TGA' is used throughout this policy to reference the TGA and its constituents.

This policy applies to all workers, subcontractors, and visitors to TGA sites. It is the responsibility of these parties to understand and apply the required statutory obligations, business policies, procedures and associated documentation as it applies to their scope of work.

TGA is committed to maintaining our position and reputation as a leader in our industry. This is based on our commitment to applying the principles of sustainability in the decision-making process and activities that TGA engages in across multiple disciplines. To achieve this commitment, TGA is addressing these principles in ways that include, but are not limited to:

Growth and economic benefit

- Decisions balanced between short and long term will be based on economic, environmental and community needs and considerations.
- Aiming to grow the business using tailored engineering solutions for increased benefit to the community developed through a collaborative design process.

Environment and efficient resource use

- Implementing best practice environmental management to minimise environmental harm and take opportunities to enhance local environmental outcomes.
- Efficient use of resources and maximise use of renewable/recycled alternatives (energy, materials, water) during design, construction and operation.
- Consider the life cycle of its products and services including construction, operation, and decommissioning.

Sustainable Procurement

- Protection of human rights through ensuring equal opportunity employment for all and fair labour and operating practices.
- Selection of suppliers and subcontractors through consideration of their sustainability merits and alignment with our values.

Community respect and protection

- Increasing community respect and wellbeing by demonstrated best practices in sustainable design and construction, and a collaborative engagement process.
- Providing the opportunity for public involvement and consultation, as appropriate, in all communities in which we operate.

TGA also commits to encouraging other stakeholders, including suppliers and subcontractors, to adopt our sustainability principles as part of their business activities.

Through the leadership of our senior management, TGA strives to implement beyond industry best practice throughout the delivery of Tonkin Gap and Associated Works.

Peter Hopfmueller
Alliance Director

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Appendix 2 - SDG Impact Mapping

SDG	Materiality	Positive Impacts	Negative Impacts
 3 - Good Health	High	- Reduces road congestion and traffic causing delays to users. - Improved connectivity - including Principal Share Path and Morley Ellenbrook Line integration. - Priorities of workforce culture and wellbeing through a number of initiatives and processes.	- Potential temporary noise, vibration and dust impacts to those in close proximity during construction.
 4- Quality Education	Very High	- Workforce and local business involvement on the Project can assist in promoting education (including training) opportunities for its workforce, schools, TAFE and the community. - Human resourcing and Project targets encourages the inclusion of trainees, apprentices and new graduates for contractors and new starters.	
 5- Gender Equality	High	-The Project increases female participation in the construction workforce by encouraging women in non-traditional roles. - Target set for 10% female participation.	- The project's resourcing is reflective of the typical lower levels of female participation in the construction industry
 6- Clean water and sanitation	Very High	- The Project accommodates the use of non-potable water sources for construction activities - reducing the potential to impact scheme water supply.	- Without good management of water resources such as groundwater, the Project has the potential to impact due to requirements for significant water use during construction.
 7- Affordable and clean energy	Medium	- The Project facilitates lower energy consumption during construction by selecting efficient construction methodologies. - The Project supports improved efficiencies for freight and vehicles using Tonkin Hwy due to upgrade of transport infrastructure.	- Greenhouse gas emissions produced predominantly in the form of diesel from plant and equipment during the construction phase.
 8- Decent work and economic growth	Very High	- The asset is designed to improve connectivity for commuter and freight transport to stimulate state economic growth - Procurement practices allow subcontractors to win certain packages to assist them in developing their capabilities	- Without good procurement practices in place, there is a risk of missing opportunities to enable smaller and less experienced businesses from undertaking works on the Project.
 9- Innovation and Infrastructure	High	- The Project shares its experiences to improve outcomes for other projects. - The Project engages the industry for opportunities for innovation.	- Project timeframes often mean conducting large scale innovative trials can be challenging to achieve
 10- Reduced inequalities	High	- Increase training/ work opportunities in the local area, with particular focus on Aboriginal groups - Project considers the differing levels of advantage/ disadvantage in the surrounding areas – potential differing needs/ access to road and rail assets and how this can be addressed - Asset design incorporates elements and communication of Indigenous cultural significance that results in ongoing transfer of cultural knowledge - The Project improves diversity and inclusion awareness within the team through celebrating and recognising events, promoting equality in the workplace and offering training to facilitate this learning	
 11- Sustainable cities and communities	High	- The Project provides infrastructure that supports active transport (cycling, pedestrian facilities). - Urban design aspects incorporated along the route to improve amenity, including recognition of the Aboriginal culture and heritage. - Increased safety to major traffic route through ameliorating congestion.	- Some temporary impacts to local recreational facilities during construction. - Construction will result in potential noise, vibration and light impacts to local community and impact on visual amenity temporarily.
 12- Responsible consumption and production	Very High	- Project uses surplus or waste materials from the site and local area, removing them from waste streams and diverting from landfill. - The Project plans use of lower impact materials (e.g. recycled, reused) and alternatives reducing demand for higher impact alternatives.	- Project contributes to the depletion of virgin resources resulting from the large number of projects underway, including use of materials and water. - Resource outputs (waste) are recycled wherever possible before landfill is considered. However some outputs (waste) that cannot be beneficially re-used and therefore does go to landfill (e.g. contaminated soil or asbestos).
 13- Climate action	Medium	- The Project aims to procure materials with lower carbon emissions throughout the material's supply chain. - Asset integrity and function is designed in consideration of the predicted impacts of climate change.	- The Project requires large volumes of material, some of which do not have readily available 'sustainable' alternatives. - Project operation contributes to and facilitates the production of GHG emissions.
 15- Life on Land	High	- The Project methodology seeks to protect sensitive environments during construction to mitigate indirect and temporary impacts. - Enhancement opportunities for ecological value are pursued. - Minimized impacts to the Swan River with removal of temporary pier for bridge construction.	- The Project requires clearing of native and planted vegetation. - Without effective management in place, the risk exists for contamination/pollution within the project area during construction (e.g. as a result of hydrocarbon spills). - Some construction works are required to occur in the Swan River which will cause disturbance on the natural environment in the short term.

 16- Peace justice and strong institutions	Very High	- The Project is delivered in an open, fair and flexible manner with broad reach of stakeholder engagement. - The procurement process gives consideration to sustainability and modern slavery in the supply chain of all suppliers.	- Potential impacts including noise, vibration and dust (air quality) on surrounding residential and public areas occur during construction, causing temporary nuisance.
 17- Partnerships for the goals	High	- Creation of partnerships with suppliers and local facilities. - The Project works with local stakeholders, such as LGAs, user groups and the community for outcomes beyond the project goals. - The Project fulfills its purpose to be developed in partnership with METRONET to maximize the benefit of the road and rail corridor.	

Appendix 3 – Sustainability Target Progress

Sustainability Targets

Tonkin Gap Alliance

		Target	Progress	What are we doing?
Enhanced urban design and place-making	**Enhance the Swan River Crossing and surrounding area**	Investigate opportunities to enhance the Swan River precinct identified in consultation with key external stakeholders.	Complete	External consultation has been undertaken, namely in asking stakeholders what kind of opportunities they would like to see in this area. Feedback was sought through a Facebook voting poll and various community open house events. Final designs are pending.
	Maximise connectivity for multi mode transport	Investigate the needs of all users and transport modes to identify opportunities to improve user connectivity and adopt at least one (1) per mode of transport.	On Track	Opportunities identified through consultation with some user groups including WestCycle and the PSP Working Group.
	Preserve and enhance ecological values	Investigate at least one (1) environmental enhancement opportunity.	Complete	Ecological enhancement opportunities are being identified and documented through design and construction.
	Preserve and enhance heritage values	Investigate at least one (1) heritage enhancement opportunity and adopt one (1) opportunity.	Complete	The Project has been investigating the inclusion of a heritage trail to capture local Indigenous knowledge and heritage, including European heritage. Consultation with Traditional Owners and community is ongoing and a plan is in development.
Management and mitigation of impacts to Water	**Optimise the design and groundwater interface**	Investigate opportunities for minimising the risk and challenges of the design and groundwater interface and adopt at least three (3) opportunities.	On Track	Opportunities identified and implemented for Northern and Southern dive structures including lowering of Tonkin Hwy, raised dive structures and improved subsoil drainage design.
	Minimise impacts to groundwater from contamination and acid sulfate soils	Optimise the design to minimise disturbance of acid sulfate soils and groundwater/soil contamination.	On Track	Design was optimised to account for the change in the Design Ground Water Level, in order to minimise disturbance to ASS. Raising the dive structures as noted above was a key part of this.
		Prepare an Acid Sulfate Soils Management Plan (ASSMP) with the aim to meeting the *Treatment and management of soil and water in Acid Sulfate Soil landscapes* guidelines (DWER 2015).	Complete	An ASSMP has been prepared and is being implemented during construction. The Department of Water and Environmental Regulation (DWER) and the Department of Biodiversity, Conservation and Attractions (DBCA) provided comment and approval for the plan.
		Prepare a Site Contamination Management Plan (SCMP) with the aim to meeting the *Contaminated Sites Guidelines* (DWER 2014).	On Track	A SCMP has been prepared and approved, in line with the Contaminated Sites Guidelines.
	Minimise impacts and improve discharge quality to surface water	Investigate methods and management measures to minimise unplanned or unexpected impacts on the Swan River water quality or use.	Complete	Construction Environmental Management Plan (CEMP) outlining measures to minimise impacts has been reviewed and approved by DBCA.
Efficient resource use and sourcing	**Optimise material selection and quantity**	Investigate opportunities to reduce the use of material and adopt at least two (2), with a stretch target for four (4) opportunities for material reduction/use of recycled products.	Complete	Opportunities to use recycled materials and reduce overall material use identified in the resource efficiency workshop and documented. Some examples include removal of the temporary pier in the Swan River and use of reclaimed materials from site.
	Reduce energy requirements and emissions	Investigate energy efficiency opportunities and implement at least three (3).	Complete	Opportunities identified to reduce energy use on the project include use of lower carbon concrete, LED lighting for some components and removal of temporary pier, reducing fuel requirements.
	Reduce water requirements	Investigate opportunities to improve water efficiency and adopt at least three (3).	Complete	Some opportunities identified and documented with investigation ongoing through construction. An example is the reuse of dewatering effluent for dust suppression.
	Reduce waste and maximise onsite reuse and recycling	Investigate waste minimisation and recycling opportunities on the project and adopt at least three (3).	Complete	Waste minimisation opportunities being investigated for the office and onsite, including the reuse of various demolished materials, elimination of temporary works, office waste segregation and the removal of single use waste from office and crib rooms.
	Integration of offsite recycled products and materials	Investigate opportunities to replace the use of virgin materials and adopt at least two (2), with a stretch target for four (4) opportunities.	Complete	Opportunities to integrate offsite recycled materials identified in the resource efficiency workshop including use of recycled material from the Roe Highway and Kalumuna Road Interchange project and import of crushed recycled concrete.
Industry Prosperity	**Improve workforce diversity and wellbeing**	Achieve 4 on the cultural and wellness survey of team cohesion.	Complete	First survey conducted in late March 2021, achieved a 75% response rate and 87.5% satisfaction rate.
		Fundraise for 1 event supporting people living with disabilities such as City to Surf for Activ (host a team etc.).	Planned for 2022	Planned for 2022 - due to Covid disruptions, the 2021 event was cancelled.
		Celebrate 1 event during Pride Month or throughout the year.	In Progress	Planning underway for activities to be celebrated during WA Pride month.
		Develop a Flexible Working Arrangements Policy.	Complete	Flexible Working Arrangements policy has been prepared and is in use.
		Investigate engagement through the Infrastructure Ready Program.	In Progress	Discussion ongoing with Main Roads.
		Celebrate 1 event for Harmony Week.	Planned for 2022	Planning underway for Harmony Week in March 2022.
	Develop capability and capacity in small subcontractors	Prepare at least three discrete packages of work to enable to WA Limestone to achieves Main Roads prequalification level R2, and two other small subcontractors have intent to submit for B1/R1.	In Progress	Work is ongoing to enable WA Limestone the opportunity to achieve the prequalification level R2 and at least 2 small subcontractors have been identified and are working towards a B1/R1 level.
	Increase Aboriginal participation	Investigate and establish business baseline for engaging Aboriginal businesses during construction.	Complete	Information which informed development of workforce targets and procurement assessment criteria considered the business baseline.
Consultation and Partnership	**Effective community engagement**	Communicate to external stakeholders and the community the proposed dust mitigation strategies and monitoring.	Complete	Community notices relating to upcoming works include commentary on potential dust impacts and how they will be managed by the project. These are sent out regularly as different work activities arise.
		Communicate to external stakeholders and the community the proposed noise mitigation strategies and monitoring.	Complete	Community notices relating to upcoming works include commentary on potential noise impacts and how they will be managed by the project. These are sent out regularly as different work activities arise.
		Communicate to external stakeholders and the community the proposed vibration mitigation strategies and monitoring.	Complete	Community notices relating to upcoming works include commentary on potential vibration impacts and how they will be managed by the project. These are sent out regularly as different work activities arise.
		Complete stakeholder satisfaction surveys every 6 months and achieve at least a 60% rate for community satisfaction.	On Track	First stakeholder survey conducted in late 2020 with average satisfaction rate of **84%** achieved. A client survey (PTA, MRWA) has also been undertaken, providing good feedback to the Alliance.
		Complete community perception surveys every 6 months and achieve at least a 50% rate for community sentiment.	On Track	First survey conducted in late 2020 by an external organisation, and scheduled to occur 6-monthly. The final consultation report, demonstrating **90%** of community surveyed has positive sentiment towards project.

Sustainability Targets

	Target	Progress	What are we doing?
Improve the outcomes for the Swan River and other key precincts through consultation	Identify and implement targeted stakeholder engagement activities.	On Track	Activities outlined in the CSES are being undertaken. This is demonstrated through various internal audits and tracking of implementation action, updated on a monthly basis to reflect engagement undertaken.
	Stakeholder input influences more than one (1) priority project negotiable (as defined in the CSEP).	Complete	Various examples of stakeholder input for project negotiables identified and being tracked. Priority negotiables are regularly reviewed as the project progresses and construction focuses in different areas. Implemented examples include the inclusion of noise walls on Redcliffe bridge.
	Consult with key external stakeholders to identify opportunities.	On Track	Ongoing engagement with external stakeholders has contributed to identification of various opportunities and these will be further developed as construction progresses - further engagement will also be undertaken with proposed working group.
Effective decision making with METRONET through collaboration	Complete monthly meetings with Metronet to establish progress and obtain feedback for integration with the project.	On Track	Regular consultation occurring between TGA and MEL design teams involves safety in design workshops, technical sessions and interface meetings.

Appendix 4 - List of Protected areas the Project interfaces with:

Protected Area	Description
Swan Canning Riverpark and Development Control Area	Department of Biodiversity, Conservation and Attractions – Development Control Area
Modified Tree – site ID 37868	Aboriginal Heritage
Swan River – Mythological, site ID 3536	Aboriginal Heritage

Appendix 5 – Protected vegetation, flora and fauna species and habitats

Protected Vegetation, Flora and Fauna Species and Habitats	Common Name	Image
Banksia Woodlands of the Swan Coastal Plan Threatened Ecological Community	Banksia Woodlands of the Swan Coastal Plan Threatened Ecological Community	
Calyptorhynchus banksii naso *Vulnerable*	Forest Red-tailed Black Cockatoo	
Calyptorhynchus baudinii *Endangered*	Baudin's Black Cockatoo	

Calyptorhynchus latirostris *Endangered*	Carnaby's Black Cockatoo	
Calidris ferruginea *Critically Endangered*	Curlew Sandpiper	
Neelaps calnotos	Black Striped Snake	

Oxyura australis	Blue-billed Duck	

Appendix 6 – List of Stakeholders to the project

Category	Stakeholder
Government	**Federal** ▪ Federal Minister for Population, Cities and Urban Infrastructure, Alan Tudge ▪ Hon Steve Irons MP, Member for Swan ▪ Mr Patrick Gorman MP, Member for Perth ▪ Shadow Minister for Infrastructure, Transport and Regional Development - Hon Catherine King MP
	State ▪ Premier Hon Mark McGowan MLA ▪ Minister for Transport and Planning, Hon Rita Saffioti MLA ▪ Cassie Rowe MLA - Member for Belmont ▪ Lisa Baker MLA – Member for Maylands ▪ Dave Kelly MLA – Member for Bassendean ▪ Minister for Finance, Aboriginal Affairs, and Lands, Hon Ben Wyatt MLA ▪ Minister for Police; Road Safety, Hon Michelle Roberts MLA
	Local ▪ City of Belmont - Cr Phil Marks- Mayor ▪ City of Bayswater - Cr Dan Bull – Mayor (and impacted resident) ▪ City of Swan - Cr Kevin Bailey - Mayor
Government Departments and Agencies	**Federal** ▪ Infrastructure Australia ▪ Treasury ▪ Department of Infrastructure and Regional Development ▪ Department of Agriculture, Water and Environment ▪ Australian Communications and Media Authority
	State ▪ Department of Transport ▪ METRONET ▪ Public Transport Authority ▪ Transperth

Category	Stakeholder
	▪ Department of Biodiversity, Conservation and Attractions ▪ Department of Water and Environmental Regulation ▪ Department of Planning, Lands and Heritage ▪ Road Safety Commission ▪ Department of Premier and Cabinet ▪ Department of Aboriginal Affairs ▪ Botanic Gardens and Parks Authority ▪ Department of Environment Regulation ▪ Department of Fire and Emergency Services ▪ Department of Local Government and Communities ▪ Department of Parks and Wildlife ▪ Department of Water ▪ Development WA ▪ Tourism WA ▪ Main Roads Heavy Vehicles Operating Section ▪ Racing and Wagering Western Australia (RWWA)
	Local ▪ City of Belmont ▪ City of Bayswater ▪ City of Swan ▪ Town of Bassendean ▪ The Eastern Metropolitan Regional Council (EMRC) ▪ WA Local Government Association
Service Providers and Customers	▪ Western Power ▪ Water Corporation ▪ Atco ▪ All telephone carriers ▪ NBN

Category	Stakeholder
	▪ Alinta ▪ Nextgen Networks
Motorists	**Motorists and road users:** ▪ Transport Forum WA Inc ▪ WA Road Transport Association ▪ Freight and Logistics Council WA ▪ WA Farmers Federation ▪ Livestock and Rural Transport Association ▪ Royal Automotive Club of WA ▪ WA Pilot Drivers Association ▪ WA Road Transport Association ▪ Planning and Transport Research Centre ▪ Heavy vehicle operators ▪ Taxi and similar operators
PSP Users	**Cyclists and pedestrians** ▪ WestCycle ▪ Bicycling WA ▪ Cyclesport WA ▪ Visibility ▪ Department of Transport Network Planning ▪ Belmont City Cycling Crew
Businesses, Clubs and Groups	**Businesses and associations** ▪ Bayswater Village Retailers Trade Association ▪ Chamber of Commerce and Industry WA (CCI) ▪ Local Business Enterprise Centre/s (BEC) ▪ Local Business Advisory Group/s ▪ Directly affected commercial properties ▪ DFO ▪ Perth Airport Pty Ltd

Category	Stakeholder
	▪ WA Racehorse Owners' Association Inc ▪ WA Trainers' Association ▪ Perth Racing ▪ The Avon Descent committee ▪ Costco ▪ Tonkin Highway Industrial Estate
	Community Groups ▪ Future Bayswater ▪ Bayswater Historical Society ▪ Belmont Resident and Ratepayer Action Group ▪ Bayswater Residents Association ▪ Swan Valley Ratepayers & Residents Association ▪ The Belmont Community Group ▪ Local Rotary, Probus, Senior Citizens, APEX and other community groups ▪ Places of worship ▪ Schools – Redcliffe Primary, St Maria Goretti's Catholic School, Hampton Park Primary School ▪ Facebook pages for local groups
	Environment groups ▪ Claughton Reserve ▪ Riverside Gardens ▪ Gobba Lake ▪ Joan Rycroft Reserves ▪ Friends of Lightning Swamp ▪ Save Whiteman Park
	Recreational Groups ▪ Bayswater Boat Ramp - fisherman ▪ Houghton Park and sporting clubs

Category	Stakeholder
	▪ Morley Windmills Soccer Club at Wotton Reserve ▪ Bayswater Skate Park ▪ Elstead Reserve - Casual Footy Co ▪ Perth Broncos Gridiron ▪ Morley Eagles Tee Ball ▪ Noranda Junior and Senior Football Clubs ▪ Noranda Sporting Association - Lightning Park ▪ River users e.g Kayak groups, Wine tour groups etc
Aboriginal Stakeholders	▪ South West Aboriginal Land and Sea Council (SWALSC) ▪ Whadjuk Working Party ▪ Traditional Owners Advisory Group (established for this project) ▪ Noongar Chamber of Commerce and Industry (NCCI)
Community	▪ Residents within 100m of project works ▪ Residents within 500m of project works ▪ Residents within 1km of project works ▪ Residents and businesses from surrounding communities ▪ Horse trainer's (specialty group)
Media	▪ Print ▪ TV ▪ Social ▪ Radio