NorthConnex
Sustainability Annual Report
2017
The $3 billion NorthConnex project (the project) will deliver significant benefits to road users across Sydney, with the opening of the twin nine-kilometre tunnels expected in late 2019. NorthConnex is the longest road tunnel project in Australia, and will link the M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at West Pennant Hills. The tunnel will remove around 5,000 trucks daily from Pennant Hills Road, helping to improve safety, local air quality and reduce existing traffic noise. The project is being delivered by Lendlease Bouygues Joint Venture for the proponents Roads and Maritime Services and Transurban, with the tunnel to be operated and maintained by NorthConnex Company Pty Ltd (consisting of Transurban and the Westlink M7 shareholders).

Major construction work along the project alignment began in 2016 including the establishment of civil construction, excavation of tunnel shafts and commencement of tunnelling. In 2017, work progressed with the commissioning of 20 roadheaders to continue excavation of the 21 kilometres of mainline tunnels and ramps. This work culminated in the first breakthrough between two tunnelling sites – the Southern Interchange and Wilson Road compound – in December 2017. On the surface, progress was also achieved with 12 major traffic switches as part of works to build the tunnel access points. The project continued to prioritise improvement of water reuse and waste management as it reached peak production.

As part of the project’s delivery, the team has committed to a diverse range of environment, sustainability, stakeholder engagement and safety objectives to help ensure the local community is left with a lasting positive legacy. The 2017 Annual Sustainability Report provides an overview of the project’s environmental and sustainability management performance, knowledge sharing initiatives, lessons learnt and the range of benefits generated beyond the project within the natural environment and wider community.

This report takes a whole-of-project approach and includes the views of our key stakeholders and partners. It demonstrates the effort and pride that goes into achieving our ambitious sustainability targets and objectives across the project. To date, the project has achieved and exceeded sustainability requirements through ongoing dedication to learning and innovation, which will improve industry practices and benefit future generations.

We hope you enjoy learning about NorthConnex and our progress during 2017 as much as our team enjoys working on such an exciting project.

- NorthConnex Lendlease Bouygues Joint Venture Sustainability Team
SUMMARY

The NorthConnex Sustainability Annual Report provides an overview of the project’s environmental and sustainability achievements during 2017, demonstrating the sustainability performance outcomes met. Key improvements implemented on the project are also identified, highlighting the decision-making process for sustainable design and innovation which have resulted in considerable reductions in water, material procurement and energy use.

The structure of this report reflects the Lendlease and Bouygues Construction Australia sustainability reporting schemes, as well as the requirements of the Infrastructure Sustainability Council of Australia (ISCA) rating system to achieve an ‘Excellent’ rating for both the Design and As Built components.

ACKNOWLEDGEMENT

The NorthConnex project team acknowledges and pays respect to the Gadigal, Darkinjung and Guringai people as the Traditional Custodians of the land on which this project is being built, forming part of the wider Aboriginal Nation known as the Eora. We also acknowledge and pay respect to the present Aboriginal and Torres Strait Islander people who reside near the project area.

As per the requirements detailed to achieve an As-Built Excellent Rating with ISCA, this report meets Man-6 Level 3 to publically report on sustainability performance annually and Man-7 Level 3 to extend knowledge sharing initiatives beyond the project to the wider industry.
The Lendlease Bouygues Joint Venture (LLBJV) is committed to protecting the natural and cultural environment in which we are delivering the NorthConnex project. We consider environmental legislation, regulations and other requirements to be the minimum standard expected of the team and in addition, we actively support and promote initiatives which deliver beneficial environmental, social and economic impacts. We recognise our influence extends beyond construction activities to include our supply chain and endorse the efforts by suppliers to adopt sustainable practices.

LLBJV exhibits leadership in our environment and sustainability practices by ensuring the continuous improvement of our Environmental Management System (EMS). In implementing this Environment and Sustainability Policy, our objectives are to:

- Identify and manage impact from work activities on the surrounding environment and communities to deliver positive outcomes for our neighbours;
- Foster a work culture which values environmental sustainability, environmental protection and best practice health and safety performance;
- Achieve industry recognition including an ‘Excellent’ As-Built Infrastructure Sustainability Council of Australia (ISCA) rating;
- Monitor and review sustainability management objectives, targets and outcomes to improve current practices;
- Reduce energy and water consumption, improve energy efficiency and minimise pollution across the project;
- Maximise opportunities to recycle resources including captured and treated water and construction and demolition waste;
- Understand, mitigate and minimise ecological and heritage impacts;
- Communicate openly with the client, government and community on environment and sustainability issues;
- Develop and deliver training materials that communicate environmental management policies to all employees and subcontractors; and
- Work with our local and regional supply chain (including from low socio-economic communities) to develop innovative solutions, sustainable practices and materials, and identify and implement restorative actions.

The Environment and Sustainability Policy is derived from the three triple bottom line pillars of sustainability and environment; environment, finance and social integration. There are multiple sub-categories within these focus areas which associate and relate to a variety of aspects within the project, ranging from procurement and supplier engagement, to the natural environment and heritage items. The sustainability outcomes within the Environment and Sustainability Policy are aligned with these focus areas and sub-categories.

The below diagram illustrates the specific sub-categories which lie within the three pillars of sustainability within the Project.
“The project has excelled in the sustainability space over the past year, which is a tremendous effort considering a project of this size and scope of works involved. Sustainability targets and objectives have influenced all sectors across the project, ranging from construction and procurement, protecting the natural environment in which we operate, and leaving a lasting positive legacy for the community in which we are operating. 2017 was a big year, and it is exciting to think what will be achieved in the year to come.”

“The NorthConnex project continues to set a leading standard for the delivery of sustainable infrastructure. Collaboration across the project and its stakeholders continues to drive these outstanding sustainable outcomes.”

“In the past year NorthConnex has demonstrated it is possible for a project of this size and scope to keep sustainability at its core, and not only meet its targets but exceed them. Key to our achievements has been the development of a workplace culture which understands the importance of sustainability not only as a construction principle, but lasting positive social legacy.”
2017 PROJECT ACHIEVEMENTS

January
- Completion of a major traffic switch for northbound motorists using the M1 Pacific Motorway.
- NorthConnex hosted a site visit from Engineering Aid Australia, a charity supporting Indigenous secondary school students who have an interest in pursuing a career in engineering.

February
- The project reached a key training milestone with more than 400 employees trained by Mates In Construction about suicide awareness.

March
- The project was visited by Road and Maritime Services Environmental General Manager Michael Crowley as part of an environmental and sustainability onsite inspection, which concluded the project is demonstrating a high level of environmental performance in a constrained and high risk setting.
- Minister for Transport and Infrastructure Andrew Constance visited the project to inspect tunnel progress and use of an innovative construction documentation app known as Construction Cloud.
- 65 staff members successfully completed the Wild Women on Top Sydney Coastrek walk raising about $45,000 for the Fred Hollow’s Foundation.
- Traffic switch completed on the Hills M2 Motorway off ramp.
- Traffic switch completed at southbound lane along the M1 Motorway.
- Thornleigh West Public School visited the Northern Compound and named a Mitsui Mike roadheader ‘Petra’.
- The project partnered with not-for-profit organisation San Foundation at Wilson Compound to name a roadheader ‘Michelle’.
April
- The Darling Mills Bridge deck slabs and stitch pours were completed.

May
- Spoil haulage to Hornsby Quarry commenced.

June
- South civil traffic switch of Pennant Hills Road westbound on-ramp accessing the M2 Motorway onto the new alignment.
- The first community In Site tour of the Northern tunnel site on 29 June was a success, as evidenced by the following feedback:
  “I think you guys are doing a marvelous job. I’m really impressed.”
  “The In Site tour for residents who are highly impacted by the work is an excellent initiative and NorthConnex should be congratulated on its efforts in dealing with the community. I just finished filling out the feedback form you left me - I gave you five stars.”
July
- NAIDOC week was promoted and celebrated across the project from 2 to 9 July, 2017, through a number of activities including a cultural awareness training session for construction workers, daily emails from the Human Resources team on Indigenous culture and history, and a presentation by a LLBJV Indigenous employee about her language and cultural identity.
- The project partnered with Lendlease and the University of Technology Sydney Galuwa program to give Aboriginal and Torres Strait Islander high school students the opportunity to participate in a site tour of the project and speak with engineering and IT experts to encourage careers in these fields.
- The Environment and Sustainability team participated in National Tree Day on Thursday 27 July. Trees and shrubs were donated to the project by a local nursery and planted at Hornsby Quarry between the haulage road and native bushland to help regeneration.
- Works on Yale Close Bridge were completed.
- Works on M2 Motorway eastbound off ramp traffic switch were completed.
- The Sustainability Team launched a SleepFit Program, with almost 400 employees participating in the initiative.
- The project organised free health checks for staff in partnership with Bupa. About 200 appointments were made covering a range of health measurements.
- A survey on the effectiveness of the project's communication was emailed to our database with an offer to donate $5 to the Hornsby Kuringai Women's Shelter. We received 531 responses, raising $2,655 for the Shelter. In rating their experience so far in dealing with NorthConnex, 72 per cent of respondents rated us ‘Good’ or ‘Excellent’ and we achieved ‘Excellent’ ratings on the nine other key criteria.

August
- NorthConnex collaborated with University of NSW and 10 Masters students who participated in two case study projects that were designed to engage the students in the importance of sustainable design within the infrastructure industry.
- More than 60 staff took part in the annual City2Surf event.
- South Civil achieved a traffic switch on Pennant Hills Road.
- North Civil completed portal piling works along Cockle Creek.
- Darling Mills Creek bridge was certified.

September
- NorthConnex held their annual Community Day on Friday 28 September and delivered three projects with approximately 70 staff volunteering their time.
- The project reached the halfway tunnelling milestone, which was celebrated with a visit to Trelawney Street Compound by NSW Premier Gladys Berejiklian, Federal Infrastructure Minister Paul Fletcher, Minister for Innovation and Hornsby MP Matt Kean, Berowra MP Julian Leesser and Hornsby Mayor Philip Ruddock.

October
- The project was announced as a finalist in the Infrastructure Sustainability Council of Australia's IS Impact awards for the project's work to improve workforce training and wellbeing.
- Southern tunnels commenced waterproof lining within the tunnel.
- North Civil team achieved a significant project milestone with the completion of the M1 southbound bridge which will carry motorists above the future Northern Interchange tunnel portal.
- South Civil team successfully excavated the future northbound on-ramp from the M2 to NorthConnex, breaking through at the portal to provide access underground.
- On Monday 29 October the project opened the third general traffic westbound lane on the Hills M2 Motorway between Pennant Hills Road and Windsor Road. The opening was three months ahead of schedule and in peak hour has improved motorists’ journey times by up to 15 minutes.
- South Civil M2 Motorway eastbound cycle way structure was installed.
- LLBJV supported and donated to the Giant Steps Autism Regatta on the 20th October.

November
- The sites across the project participated in Movember, raising $6000 for prostate cancer research.

December
- The largest media event of the year was held at Southern Interchange on December 13th to mark the breakthrough between Pennant Hills and West Pennant Hills. The event was attended by Prime Minister Malcolm Turnbull, NSW Premier Gladys Berejiklian, Federal Infrastructure Minister Paul Fletcher, NSW Minister for Infrastructure and Transport Andrew Constance as well as local state and federal government representatives.
- Approximately 1,000,000 tonnes of spoil placed at Hornsby Quarry as the end of December 2017.
**TARGETS AND OBJECTIVES**

The NorthConnex Environment and Sustainability Policy sets clear environmental, social and economic targets for the Project. Project contracts, parent company procedures and ISCA requirements were carefully considered in the formation of these goals. Objectives and targets reflecting the Project's commitment to sustainability and continuous improvement across the following categories:

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<tr>
<th>OBJECTIVES</th>
<th>TARGETS</th>
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<tr>
<td><strong>ENERGY</strong></td>
<td>• Reduce energy consumption and improve efficiency</td>
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<td>• Maximise opportunities to reuse captured and treated water during construction and operation, and community projects</td>
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<td>• Reduce water consumption, improve efficiency and prevent pollution</td>
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<td><strong>WATER</strong></td>
<td>• Reduce water consumption, improve efficiency and prevent pollution</td>
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<td><strong>WASTE</strong></td>
<td>• Maximise opportunities to reuse, recycle and recover construction and demolition waste in construction, operation and community projects</td>
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<td>• Implement an Environmental Risk Management Procedure that minimises environmental impact</td>
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<td>• Measure, understand and minimise ecological and heritage impacts</td>
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<td>• Identify and manage impacts on the surrounding environment arising from work activities and capitalise on identified opportunities</td>
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<td>• Communicate openly with the client, government and engage the community on environment and sustainability issues</td>
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<td>• Identify and manage work impacts on the community and capitalise on identified opportunities</td>
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<td>• Empower the community with knowledge, learning and information</td>
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<td><strong>NATURE</strong></td>
<td>• Support local business to sustain the town centre atmosphere</td>
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<td><strong>COMMUNITY DEVELOPMENT</strong></td>
<td>• Develop and deliver training materials that communicate environmental policy to all employees and subcontractors</td>
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<td>• Foster a work culture which values environmental sustainability, environmental protection and best practice health and safety performance</td>
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<td>• Educate employees on personal health and wellbeing strategies</td>
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<td><strong>MATERIALS &amp; SUPPLY CHAIN</strong></td>
<td>• Provide accessible initiatives which encourage a healthier lifestyle and mindset</td>
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<td><strong>TRAINING, SKILLS &amp; EMPLOYMENT</strong></td>
<td>• Develop and deliver training materials that communicate environmental policy to all employees and subcontractors</td>
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<td><strong>HEALTH &amp; WELLBEING</strong></td>
<td>• Build respect, value and understanding of the culture of Australia’s first people</td>
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<td>• Encourage Aboriginal and Torres Strait Islander leadership</td>
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<td>• Build respectful relationships to deliver opportunities</td>
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<td><strong>DIVERSITY &amp; INCLUSION</strong></td>
<td>• Build respect, value and understanding of the culture of Australia's first people</td>
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<td><strong>2017 OVERVIEW</strong></td>
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<td><strong>100% OF SPOIL BENEFICIALLY REUSED</strong></td>
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<td><strong>149 ENVIRONMENTAL &amp; SUSTAINABILITY INSPECTIONS COMPLETED</strong></td>
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<td><strong>91% OF CONSTRUCTION WASTE RECYCLED</strong></td>
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<td><strong>MORE THAN 200,000KL OF WATER REUSED ONSITE</strong></td>
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| **698 ENVIRONMENTAL & SUSTAINABILITY INSPECTIONS COMPLETED ONSITE** |
| **4 WATER TREATMENT PLANTS AND A CLOSED LOOP WATER RECYCLING SYSTEM OPERATING** |
| **29 HABITAT HOLLOW TREES SAVED ALONG THE M2I DUE TO REDESIGN** |
| **250 APPRENTICES EMPLOYED ACROSS THE PROJECT** |
| **MORE THAN 1500 PEOPLE TRAINED THROUGH NORTHCONNEX HUB** |

| **300 BUSINESSES FROM WESTERN SYDNEY ENGAGED ON THE PROJECT TO DATE** |
| **94% OF COMPLAINTS RECEIVED ADDRESSED WITHIN 5 DAYS** |
| **91% OF CONSTRUCTION WASTE RECYCLED** |
| **MORE THAN $10,000 PROVIDED TO DATE FOR LOCAL CAFÉS THROUGH THE NORTHCONNEX POP UP SESSIONS** |
| **MORE THAN $58,000 RAISED FOR CHARITY BY LLBJV PERSONNEL** |

| **NORTHCONNEX TRAINING HUB CELEBRATED ITS ONE YEAR ANNIVERSARY** |
| **3041 STUDENTS PARTICIPATED IN THE SCHOOLS EDUCATION PROGRAM** |
| **29 HABITAT HOLLOW TREES SAVED ALONG THE M2I DUE TO REDESIGN** |
| **‘GREEN LIGHT’ RESULT FOR 84% OF INDEPENDENT ENVIRONMENTAL INSPECTIONS** |
| **MORE THAN $58,000 RAISED FOR CHARITY BY LLBJV PERSONNEL** |

| **4 WATER TREATMENT PLANTS AND A CLOSED LOOP WATER RECYCLING SYSTEM OPERATING** |
| **324 ENVIRONMENT TRAINING SESSIONS CONDUCTED AT THE NORTHCONNEX TRAINING HUB** |
| **ACHIEVED 47% WATER REUSE ACROSS THE PROJECT** |
| **60% INCREASE IN NESTING BOXES OCCUPATION COMPARED WITH PRE-CLEARING SURVEY** |
| **MORE THAN $10,000 PROVIDED TO DATE FOR LOCAL CAFÉS THROUGH THE NORTHCONNEX POP UP SESSIONS** |
ACHIEVEMENTS AND
INDUSTRY INVOLVEMENT

ISCA Design Rating and As-Built Progress
The NSW Minister for Planning’s Conditions of Approval for NorthConnex require an Infrastructure Sustainability Council of Australia (ISCA) Design and As Built rating of ‘Excellent’ to be achieved on the project. In October 2016, NorthConnex was officially awarded a ‘Leading’ Infrastructure Sustainability (IS) Design rating by ISCA. Leading is the highest rating possible and recognises the exceptional work on the project. The NorthConnex Sustainability Team is currently working on the As Built Rating for the project, which will be submitted in late-2019 following practical completion of the project.

ISCA Industry Involvement in 2017
ISCA Conference
The fourth national annual ISCA Conference was hosted in Melbourne for the first time, with more than 65 speakers sharing key learnings from their sustainable infrastructure projects. The project had two representatives attend the three day conference, learning about the key themes of smart infrastructure, embracing change through flexible design, the impact of sustainability on infrastructure planning, financing and procurement, and international perspectives and trends. These learnings were shared within the project through presentations and integrated within various sustainability categories.

IS Awards Dinner
Each year, an annual awards gala dinner is hosted by ISCA to recognise the highest achievers in infrastructure sustainability in Australasia. The 2017 Melbourne event was hosted by comedian Craig Reucassel, with more than 240 attendees. The IS Impact award acknowledges projects that are driving outstanding leadership and advancing infrastructure sustainability in Australasia. NorthConnex was a finalist for the IS Impact award, within the category of a project value greater than $20 million. Being selected as a finalist demonstrates the efforts undertaken by the NorthConnex Team to increase the health, wellbeing, development and performance of its people.

Developing Training with ISCA
ISCA compiled a series of short training films that focused on project case studies. NorthConnex was chosen to participate in February 2017, with the Sustainability Lead of the project filmed to discuss the key sustainability benefits of the project. Themes of the training film included energy and water savings, and the importance of generating social legacy. The video is now used in ISCA training events and as a case study.

Involvement with Sustainability Master Students
ISCA and NorthConnex are actively engaged with University of New South Wales’ (UNSW) sustainability masters students. NorthConnex submitted case studies to the master’s students, and the Sustainability Lead of the project worked with the 10 students to assist in choosing a case study for their research projects. The findings were showcased at a presentation and networking event in October 2017.

Launch of ISCA Operations Rating Scheme
Environmental and sustainability representatives from Transurban and LLBJV attended a breakfast where the operations rating component of ISCA’s rating tool was launched in February 2017. The event was an opportunity for industry partners to learn about the IS Rating tool and the positive outcomes that can be achieved when implementing an IS rating for operational infrastructure.

Secondment partnership
Towards the end of 2017, Jaclyn Fathers, Sustainability Lead on NorthConnex, secured an exciting secondment opportunity with ISCA for a period of six months. The secondment has been funded through Lendlease Foundation as it is an excellent opportunity to further strengthen our partnership with ISCA as the industry benchmark for sustainability in infrastructure.
CARBON & ENERGY EFFICIENCY

The responsibility to reduce energy use and carbon output has been carefully considered during the construction of the tunnel and associated infrastructure, as well as the operational phase. The project team have committed to reducing the asset's total carbon output through the implementation of innovative design and the development of leading technology.

ENERGY REDUCTIONS & INNOVATIONS THROUGH DESIGN

LED Lights
Traditionally, road tunnels throughout Australia use high pressure sodium (HPS) lights. As part of the decision making and design process, the NorthConnex tunnel will utilise two of latest light emitting diodes (LED) technology. The use of LED lights rather than HPS lights will reduce the total number of lights needed within the tunnel, and the amount of energy required to power the lighting system. This technology will reduce carbon emissions by an estimated 83,000 tonnes, in comparison to HPS lights.

Example of an LED light to be installed in the NorthConnex Tunnel

Advanced Tunnel Lighting Solution
An innovative lighting control system is being utilised on the NorthConnex tunnels. This system uses computerized controllers to adjust the light output from each light (dimming system) instead of the more conventional approach of switching banks of lights on and off. This method does not affect safety or visibility for motorists.

As the lights can be dimmed to the precise level needed, there is a small power saving. However, the key benefit is the material savings in cabling and central cabinets to be procured and installed.

VSD Fans
An additional energy saving innovation is the implementation of variable speed drive (VSD) fans within the tunnel rather than traditional direct on line fans. VSD fans allow for the speed of the fans to be adjusted based on the number of cars travelling through the tunnel. During off peak traffic times, VSD fans can be adjusted to use less energy, which will result in dramatic reductions in carbon emissions across the operation of the project.

The modelled use of VSD fans shows a total energy savings of 44 per cent compared to conventional fans and an overall 20 per cent energy saving across the operational life of the asset.

Fuel Use
The volume of fuel utilised during construction has the potential to result in high levels of carbon emissions. A significant reduction in carbon emissions can be achieved by reducing transportation needs. Methods to reduce transportation include using local suppliers and spoil disposal sites that are in close proximity to the project. The Mount Ku-ring-gai Batch Plant has been established close to the northern section of the project to efficiently supply concrete.

A spoil disposal site has also been established at the Hornsby Quarry, which is only four kilometres from the closest tunnelling site. The use of spoil sites in close proximity to the project has the potential to save 3.7 million kilometres of travelling distance, and in turn reduce carbon emissions by 75,000 tonnes. Alternative sites to transport the spoil from the tunnel sites are up to 80 kilometres away, which has much greater impacts. To date 1.9 million litres of fuel has been saved as a result of hauling to the Hornsby Quarry.

In addition, mini buses have been made available to personnel working onsite to travel between construction compounds and a communal parking facility, to further minimise the fuel impact of the project.
Across the project to date, around 300 businesses based in western Sydney have been engaged to supply materials, goods and services. Steel makes up a sizeable component of materials procured, with the type and quantity ultimately having a large impact on the total carbon emissions.

NorthConnex is minimising the amount of steel required and ensuring the correct products are utilised in order to achieve a reduction in carbon. The onsite acoustic sheds were produced from Industrial Light Beam (ILB), which is designed to achieve significant carbon and water savings by minimising the amount of steel required to create a beam, in comparison to conventional hot rolled product design. The use of the ILB instead of ordinary steel has resulted in a modelled 55 per cent carbon emission decrease for the acoustic sheds. NorthConnex has also lowered energy consumption by having steel lengths cut and bent to size, resulting in less offcuts and more efficient steel production.

NorthConnex is engaging suppliers which are committed to reducing carbon emissions. Liberty OneSteel has committed to increasing resource and energy efficiencies in the production and distribution of their products, and during the use of steel products. The company has developed and utilised a polymer injection technology during their steel production that results in 15 to 35 per cent carbon savings. The use of this technology and a variety of other techniques has granted Liberty OneSteel an independent Environment Product Declaration that demonstrates their commitment to sustainable practices.

“Liberty OneSteel has supplied NorthConnex with enough steel reinforcing to stretch from Sydney to Perth, much of which has been manufactured, processed and fabricated at our sites in western Sydney.

This project underpinned approximately 300 direct employees at our Steel Mill in Rooty Hill which is a major western Sydney employer. The opportunity to supply the NorthConnex project with sustainable Australian-certified steel reinforcing and mesh solutions for use in the project makes a welcome contribution to employment in western Sydney.

The project involves a number of outstanding local businesses in the supply chain, including Liberty OneSteel Reinforcing, as well as fabricators, fixers and transport companies that consistently demonstrate their commitment to building a better Sydney. Liberty OneSteel is proud to contribute to projects of the scale and importance of NorthConnex. This is nation-building at work, paving the way for the future of our workforce, communities and Australia.”

Neil Gibson, Executive General Manager of Liberty OneSteel

“Reinforcement to support on and off ramps at Northern Interchange June 2017”
Concrete Specifications

The Mount Ku-ring-gai Batch Plant will achieve further energy reductions through the use of recycled byproducts such as fly ash in concrete designs. A variety of different concrete designs are being used with up to 60 per cent cement substitution. This could reduce carbon emissions by up to 64,000 tonnes. The majority of this concrete is supplied by Boral who operate the batch plant. Boral place a similar importance on sustainability as NorthConnex and work effectively to assist the project meet its high sustainability requirements.

“At Boral, we recognise that sustainability is fundamental to our future success and our ability to build something great with our customers. We are committed to taking a socially responsible and sustainable approach to how we operate including achieving world-class safety performance and developing less resource- and energy-intensive products for our customers. In supplying construction materials to NorthConnex, we are using quarry products coming into Sydney by rail and a combination of fixed and mobile concrete plants to minimise trucks on the road, which is better for the environment and good for the community.”

Rod Johnson, Boral Environmental Manager - NSW/ACT
The importance of protecting and preserving potable water as a scarce resource has been incorporated into the management of the project, establishing the site compounds and commencing tunnelling. The team has targeted a high level of water reuse across the project, with two key objectives within the project highlighting these key visions and values.

NorthConnex has and will continue to change the perception and culture around water use onsite in order to reduce the total amount of potable water used. All potable water onsite is metered in order to track and continually analyse the total water usage each month. The project is aiming for a greater than 50 per cent reduction in potable water use, which will be achieved through innovative technology, water saving initiatives and an aligned team.

**WATER TREATMENT PLANTS**

Large volumes of water are required during tunnel construction to support the operation of the road headers and rock bolting machines, as well as for dust suppression at the cutting face and spoil haulage. The ability to capture and recycle water within the tunnel can result in significant water savings across the project. Four separate water treatment plants were purchased and commissioned in the first half of 2016, and the recycling of water through the plant and back in the tunnel commenced in late 2016. The reuse of water dramatically increased in 2017 as the project reached a time of full production, increasing from 11.79% water reuse in 2016 to 48% water reuse in 2017.

**THE MOUNT KU-RING-GAI BATCH PLANT WATER RECLAIM SYSTEM**

The Mount Ku-ring-gai Batch Plant has a water reclaim system, which reuses captured water from wash down and dust suppression activities during concrete production. The plant has been designed to ensure that all water is captured onsite and recycled. All water used onsite that does not evaporate or is batched directly into concrete runs into a recycled water storage system, via settling pit. During normal production when weather conditions are moderate, the water utilised for the production of concrete is drawn from this onsite recycled water storage, at a rate of approximately 150 litres per cubic metre of concrete, depending on the mix specifications or aggregate moisture level.

Further innovations for onsite water reduction include a sprinkler system designed to maintain haul roads throughout the compound and wash down aggregates. This innovation reduces fuel use and removes the need for water carts and street sweepers, which require high water use. The sprinkler system can be turned on and off to meet the site requirements and enables key areas to be independently targeted.

Recycling water at the batch plant has major benefits in reducing the total amount of potable water required to be used in the concrete, and vastly reduces the amount of water that would otherwise need to be treated and discharged from the site. During 2017, the plant recycled 42% of potable water through the system.

**OVER 228,148 KL OF RECYCLED WATER REPLACED POTABLE WATER IN 2017**
MT KURING-GAI CONCRETE BATCH PLANT’S DRUMBLASTER

One of the state’s first ‘DrumBlasters’ has been installed at the Mt Kuring-gai concrete batch plant to help reduce water usage on the NorthConnex project in 2017.

Boral Concrete said the $3 billion project, which will provide an underground motorway connection between the Hills M2 Motorway and M1 Pacific Motorway, is committed to environmental sustainability including reusing water where possible.

The concrete batch plant was established close to the nine kilometre project alignment in partnership with Boral to supply more than 500,000 cubic metres of concrete.

Different types of concrete are produced to line the tunnel and form the road base. The concrete trucks must be washed out each time the concrete mix changes as well as at the end of shifts.

Usually, about 1000 litres of recycled water would be pumped into each truck’s agitator barrel and spun around to clean the barrel out. The DrumBlaster has been installed to dramatically reduce the amount of water being used to just 240 litres for a normal truck wash or 480 litres at the end of a shift.

OTHER INITIATIVES

Water savings are also being achieved through other onsite initiatives and innovations. The reuse of water from detention basins to suppress dust has been implemented from the commencement of construction.

There are detention basins at each main compound that capture rainwater so it can be treated and beneficially reused. Rainwater tanks have also been installed at some compounds during 2017 where practical, which reuses the captured rainwater through the toilet system.

A wheel-washing system has been installed at Hornsby Quarry, requiring approximately 10KL of potable water to operate. The system utilises a holding tank as a means to hold and recycle the water during each wheel-washing cycle. Each day the water from the wheel wash is pumped into a holding tank and treated, to be recirculated.
The use of four water treatment plants (WTP) to recycle water throughout the tunnel will result in significant environmental and economic benefits to the project. These benefits have been calculated based on a comparison between recycling the water through the WTP against using potable water throughout the construction of the tunnel.

The WTPs allow for a ‘semi closed loop’ system to be created, meaning that less potable water is required and the total amount of water utilisation is reduced. The system works in the following way:

1. Potable Water: An initial amount of potable water enters the system into the tunnel, which is used for construction purposes such as dust suppression and supporting the function of different tunnel machinery. Potable water is added to the system due to the difference in capacity of the water treatment plant and the construction demand.

2. Treated Water from WTP to Tasman Tank: Water circulated in the tunnel is treated, and stored in the tasman tank until recirculated into the tunnel.

3. Treated Water from Tasman Tank to Tunnel: The stored treated water in the tasman tank is recirculated in the tunnel as required for underground activities. The amount of potable water needed for construction purposes is therefore significantly reduced as the water being used has been recirculated through the system.

4. Pre-Treatment of Water from Tunnel to WTP: As the tunnel heading is excavated, groundwater egresses into the tunnel. The groundwater, along with 75 per cent of the used water, is pumped into an underground pre-treatment system, prior to being pumped to the surface and through the water treatment plant.

5. WTP to Sewer: A small amount of water on the surface is treated through the water treatment plant and discharged to sewer under a trade waste licence, in cases where the water cannot be stored onsite.

6. Treated Water Removed with Tunnel Spoil: Up to 25 per cent of the used water is absorbed into the spoil and removed during excavation.

Based on a comparison with potable water use, it is modelled that up to 42 per cent of total water use will be reduced as well as 79 per cent of total potable water. This will result in a significant reduction in the amount of water released to sewer as waste water.

CASE STUDY: WATER TREATMENT PLANT WATER CYCLE

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Tunnel construction water model indicating the significant water savings to be achieved by recycling water through the WTP.

Pretreatment of water underground at the NorthConnex Wilson Compound. Refer to #4 on the model below.

**WATER TREATMENT PLANT WATER LIFECYCLE**

1. Potable Water
2. Treated Water from WTP to Tasman Tank
3. Treated Water from Tasman Tank to Tunnel
4. Pre-Treatment of Water from Mainline Tunnel & Ramps to WTP
5. WTP to Sewer
6. Treated Water removed with tunnel spoil

Tunnel construction water model indicating the significant water savings to be achieved by recycling water through the WTP.
Reducing and recycling waste is a key objective for the project and reflects an effort to curb the growing trend of waste generation within the construction industry.

NorthConnex applies the waste hierarchy of avoidance, reduction, reuse and recycling to ensure the project does not negatively impact the environment through waste generation. Waste which is specifically monitored and managed on the project includes spoil, construction waste and office waste.

**WASTE**

**CONSTRUCTION AND OFFICE WASTE**

NorthConnex is committed to breaking current industry trends and reducing infrastructure waste, and achieve a higher rate of recycling across the construction sites and offices. All waste associated with the project is tracked and only taken to licenced waste management facilities that have the appropriate Environment Protection Licence to accept the waste.

Office waste separation facilities are provided at all site compounds and at the main NorthConnex office, with the waste being divided into four main streams. The office waste strategy is in line with the site waste strategy with all bins colour coded for ease of identification. A target of recycling more than 60 per cent of office waste has been set for the project.

**SPOIL REUSE**

Spoil is generated as a result of construction activities and consists of uncontaminated excavated clay, gravel, sand or rock that is not mixed with any other type of waste. The construction of twin nine kilometre tunnels will generate approximately 2.6 million cubic metres of spoil. This material can be beneficially reused on other projects throughout Sydney that require clean fill to complete earthworks. The project has committed to reusing 95 per cent of the spoil generated from the tunnel. To date, more than 1 million tonnes of clean spoil has been beneficially reused.

100% OF SPOIL GENERATED BY THE PROJECT REUSED

100% OF SPOIL GENERATED BY THE PROJECT REUSED

THE PROJECT IS CURRENTLY RECYCLING 91% OF ALL CONSTRUCTION WASTE

MONTHLY OFFICE RECYCLING RATE OF 58% CURRENTLY BEING ACHIEVED
KeepCup Campaign

KeepCups are reusable cups which are developed and manufactured in Melbourne, Australia. The company defines their business around local presence and reducing the environmental footprint, which aligns closely with some of the objectives of NorthConnex.

The KeepCup initiative was investigated by members of the commercial and community teams, demonstrating how the project has been able to develop a culture which values sustainable outcomes. The initiative involved promoting the use of KeepCups including at local businesses. Local cafes participating in the campaign offered to discount coffees up to $0.50 when a KeepCup is used. 140 KeepCups were sold across the Lendlease Bouygues Joing Venture team at the end of 2017, which has substantial savings in office waste generation!

“The KeepCup initiative is important because I believe we need to take a two pronged approach to sustainability; in both construction sites and construction offices. We collaborated with local cafes to ensure that they not only support the use of KeepCups but they also provide a discount on coffee purchases when you use your reusable cup. This partnership with local business means that our employees keep on using their cups and those cafes get repeat business from our KeepCup users. These discounts mean that a taking up KeepCup costs nothing, but it can save a great deal from landfill.”

Sarah Veitch, NorthConnex Commercial Team

“Sustainability influences everything we do on NorthConnex and I am immensely proud of our achievements to date. On a project of this scale, it can be easy to overlook the impacts of our everyday individual choices.”

Tim Orpen, NorthConnex Project Director

<table>
<thead>
<tr>
<th>Savings per Person in 12 Months</th>
<th>Averaging 5 Takeaway Coffees per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>260 Paper Cups</td>
<td></td>
</tr>
<tr>
<td>3KG of Landfill</td>
<td></td>
</tr>
<tr>
<td>$85.80 in Discounts</td>
<td></td>
</tr>
</tbody>
</table>

Tim Orpen with his own KeepCup
CASE STUDY: TEMPORARY NOISE WALL REUSE ACROSS THE PROJECT

The reuse of materials and existing structures has been incorporated into the design and implementation of noise mitigation measures across the project, as an innovative and effective means to reduce the utilisation of materials and waste generated, and enhances noise mitigation measures.

As a part of the M2 Integration works on the project, noise walls were required to be demolished along the existing alignment and rebuilt in an alternate location, to enable the construction of an additional westbound lane along the Hills M2 Motorway. Temporary noise walls are installed when existing noise walls are removed to facilitate construction works. These structures have been specifically designed in sections along this project so they can be mounted and removed onto a concrete barrier system, enabling them to be reused and relocated across the project as required. This in turn reduces the resources and materials required to construct and erect the other noise walls.

During the removal of the existing noise walls along the Hills M2 Motorway, a careful demolition methodology was adopted to ensure the noise walls were protected, with the intention to reuse them on the new M2 Integration noise walls. Due to minor chips not meeting the required operational specifications, the panels could not be reused on the operational noise wall. As the panels were functional and provided appropriate noise mitigation, the Hornsby Quarry was able to utilise sections of the temporary noise walls around the conveyor system and stockpile area.

When the temporary noise walls along the M2 Integration were decommissioned due to the operational noise walls being erected and completed, the Southern Interchange were able to utilise the temporary noise walls that were no longer required.
LLBJV in collaboration with Roads and Maritime Services and NorthConnex Company have achieved government and construction approvals to fill the quarry. The Hornsby Quarry site was established in 2016 and bulk spoil delivery commenced from May 2017, with up to one million cubic metres of spoil expected to be delivered from the project. The Hornsby Quarry site posed a unique challenge for rehabilitation due to its steep embankments - a legacy of when the site was used to mine breccia for road projects. The project team recognised in the project design and establishment phase that it would not be feasible to have more than 2000 trucks driving to the bottom of the quarry void every week. The truck movements would contribute to poor environmental and safety outcomes, and hence an alternative method of the conveyor system was adopted.

The project team explored the mining industry for inspiration and commissioned a $9 million telescopic overland conveyor system. The system was transported 900 kilometres from Brisbane to Sydney in about 40 pieces and was assembled on site. Approximately 160 metres long, the conveyor system has two loading bays where trucks can drive in and directly unload their trailers onto the conveyor belt. Up to 2000 tonnes of spoil per hour is then carried down to the end of the conveyor system where there is a telescopic end which moves, enabling the project team to spread spoil evenly. Before trucks depart the quarry, they drive through a brush down bay and wheel wash to prevent material entering local streets. The outcome has been a more efficient and safer method of filling the Quarry, which will be used as a recreational space once rehabilitated by Hornsby Shire Council.

**CASE STUDY: ESTABLISHMENT OF THE HORNSBY QUARRY AND THE CONVEYOR SYSTEM**
The project team recognises the significance of the natural environment and has prioritised its protection and maintenance throughout construction. Key objectives have been implemented in the project's sustainability vision to ensure the protection of the natural environment is a key factor in all decisions from the design stage through to tunnel operation.

CONSTRUCTION AIR QUALITY
NorthConnex is committed to reducing air quality impacts and ensuring our work on the project does not exceed any environmental standards imposed by the Environment Protection Authority. The key particulate which must be managed during tunnel construction is the generation of dust. Dust is controlled onsite through the use of water carts, retention of vegetation, maintenance and management of haul roads, stabilisation of ground cover, soil binders, stockpile covers and dust suppressant wherever possible.

Depositional dust gauges have been installed at construction sites and are monitored to ensure compliance. Additional controls such as dust suppressant further ensure that air quality is maintained at all times. Dust suppressants are soil binding agents applied to haul roads and exposed areas to prevent dust generation, and are particularly effective when used during shutdown periods with longer exposure to weather. Binding agents are often brightly coloured and it is therefore possible to monitor where the suppressant has been applied.

Innovations within the tunnel sites have further reduced the probability of negative air quality impacts. These mitigation measures include the establishment of acoustic sheds for all spoil handling activities, installation of construction tunnel ventilation systems including dust extractors and filtration systems, as well as installation of dust suppression mechanisms on individual tunnel machines.

SURFACE AND GROUNDWATER
The protection of local waterways around the project is a key objective to ensure there is no impact to surface or groundwater. Regular surface water and groundwater monitoring is undertaken as well as spring surveys. As some waterways pass through construction areas on the project, samples are taken upstream and downstream of the construction works to ensure water quality is maintained.

Water Treatment Plant operation during the construction and operation of the tunnel ensures that all groundwater is managed in a way that is consistent with Environment Protection Authority standards, and will ensure the potential environmental impacts are managed and adequately protected. All water discharged from construction sites are tested in accordance with the Project’s Construction Environment Management Plan.

Surface water is similarly managed through the use of onsite detention basins. All water is tested and appropriately managed to ensure that it is of the correct environmental standard prior to discharge. The sites are established to ensure that water is directed to these basins, or through a variety of erosion and sediment controls, hence no construction water can leave the site without appropriate treatment. Any water captured onsite is reused across the project where possible, such as dust suppression.
EROSION AND SEDIMENTATION

Environmental personnel managing water quality and discharges are trained in erosion and sediment control which must be compliant with the ‘Blue Book’. This training enabled the team to design plans for the site to determine the water flow directions and associated management. These plans provided direction for the construction team to install and maintain specific controls. The environmental team conduct frequent inspections of erosion and sedimentation (ERSED) controls to confirm they are operating to the highest possible standard. The sites are also inspected by an independent Environmental Representative fortnightly and regularly by a third party soil conservationist, John Wright, T.R.E.E.S P/L, who has close to 50 years of experience.

A challenge presented in 2017 was the relocation of Cockle Creek which was in direct conflict with the southbound dive structure. The creek is located at the northern section of the tunnel along the M1 Motorway. The construction methodology took into consideration multiple stages of creek relocations, in order to enable earthworks and the construction of the dive structure footings and walls. Progressive Erosion and Sedimentation Plans (PESCPs) and environmental work method statements (EWMS) were implemented for a range of different construction stages and activities which were undertaken near the creek. This ensured an extremely high level of environmental protection, with all personnel understanding the importance of protecting this local waterway.

“The NorthConnex environmental team has continued to be dedicated to planning, establishing and maintaining robust erosion and sedimentation controls as per the Blue Book guidelines, to ensure protection of the environment. A major challenge during 2017 was maintaining water quality within Cockle Creek at the northern end of the project. The creek required numerous temporary relocations to enable construction of the southbound dive into the tunnel. I have recommended this part of the project to be submitted for an erosion and sediment control award as I am impressed with the planning, construction process and dedication of site personnel.”

John Wright, Soil Conservationist, T.R.E.E.S P/L
FLORA AND FAUNA

The project is located within a heavily urbanised area where the majority of the site has been previously disturbed. However, there are pockets of native vegetation with significant ecological value that require protection and maintenance. Within the Project footprint, there is a variety of endangered species. A fencing and signage protocol has been implemented across the Project to ensure that these species are protected and all site personnel are aware of their significance. Key threatened vegetation communities and species onsite include:

- Blue Gum High Forest;
- Sydney Turpentine Ironbark Forest;
- Epacris purpurascens var. purpurascens (Epacris); and
- Miniopterus schreibersii oceanensis (Eastern Bent-wing Micro bat).

Through redesign and changes to the construction footprint, the Project has been able to successfully save more than one hectare of threatened vegetation when compared to the original footprint outlined in the Project Environmental Impact Statement (EIS). Considerable measures have been undertaken to ensure that as many trees remain intact as possible across the Project. This includes building noise hoarding around specific trees with cut outs to protect individual limbs, or delineating areas of vegetation that can be protected whilst construction works proceed in the area, under a qualified Arborist's inspection.

The protection of the Epacris on the Hills M2 Motorway demonstrates the commitment to protect as much vegetation as possible. Through redesign of large sections of the road widening works, 742 individual Epacris were protected and remain onsite.

NESTING BOXES

To mitigate the removal of hollow-baring trees potentially housing fauna, 72 nesting boxes were installed in areas adjacent to where trees were removed throughout the Project corridor.

An annual spring nesting box survey was undertaken in 2017, which showed species of rosella, lorikeet, possum, bats and native bees occupying the nest boxes, some of which are rarely seen in nesting boxes.
BIODIVERSITY OFFSET PACKAGE

The removal of vegetation across the project footprint to enable civil construction has been approved as part of the Environmental Impact Statement. Where possible the project is reducing the amount of vegetation removal required and will clear less than what has been approved. To compensate for the removal of some native trees, a biodiversity offset package has been developed. The biodiversity offset package involves the purchase of biobanking credits through the NSW Office of Environment and Heritage Biobanking Scheme.

Due to the scarcity of biobanking credits on the public market, the project team is working on an innovative solution whereby LLBJV is partnering with Ku-ring-gai Municipal Council to generate a range of credits required to offset the Project that is not available elsewhere. In addition, credits will also be sourced locally through Hornsby and Baulkham Hills Shire Councils and private suppliers. The biobanking credit requirements for the project are presented below.

<table>
<thead>
<tr>
<th>Ecosystem Credit Type</th>
<th>Current credit requirements for the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Gum High Forest</td>
<td>51</td>
</tr>
<tr>
<td>Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest</td>
<td>2</td>
</tr>
<tr>
<td>Red Bloodwood – Scribbly Gum heathy woodland on sandstone plateau</td>
<td>13</td>
</tr>
<tr>
<td>Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest</td>
<td>30</td>
</tr>
<tr>
<td>Red Bloodwood - Smooth-barked Apple shrubby forest on shale or ironstone of coastal plateau,</td>
<td>83</td>
</tr>
<tr>
<td>Sydney Turpentine-Ironbark Forest</td>
<td>3</td>
</tr>
<tr>
<td>Gang-gang Cockatoo</td>
<td>107</td>
</tr>
<tr>
<td>Epacris purpurascens subsp. purpurascens</td>
<td>4,403</td>
</tr>
</tbody>
</table>

*Table demonstrating the Biobanking Credit requirements for the project*
As part of the NorthConnex project integration works with the Hills M2 Motorway were required to accommodate westbound traffic flows from the tunnel. This included the provision of a new westbound lane on the Hills M2 Motorway extending through to the Windsor Road off-ramp. The M2 integration works have been completed prior to the opening of the NorthConnex tunnel to ensure network performance when the tunnel opens in late 2019.

Throughout the construction of the M2 Integration section of the project the following achievements were made:

• The clearing footprint was reduced to enable several habitat trees and other high value native animal habitat features to be saved, including 29 hollow bearing trees.

• NorthConnex has supplied native canopy seeds from trees at Darling Mills Creek to Hills Shire Council for future bush regeneration projects as part of its commitment to supporting environmental sustainability. The seeds will be sorted and incubated by council nursery volunteers and planted in local areas in need of revegetation.

• There was a culvert under the M2 which provides an important winter roost for the Eastern Bentwing-bat. Temporary bat exclusion measures were installed (through direction and consultation with the project ecologist) as an effective mitigation strategy when works were required during bat hibernation periods.

• The installation of a tower crane and pedestrian walkway avoided the need to install a rock and pipe bridge crossing in Darling Mills Creek. This enabled the bridge construction to be carried out with minimal impact to the creek.

• Hydromulching with seed mixes endemic to the local environment commenced at the end of 2017, and will be carried out over 16,110m² of landscaped land along M2, in accordance with the Urban Design Landscape Plan.
**HERITAGE**

The protection of significant heritage items located throughout the project footprint is an essential sustainability practice, which ensures future generations can continue to benefit and learn from the past. The Project has put various mitigation measures in place to protect these items and has used innovative technology to preserve heritage items.

**INDIGENOUS HERITAGE**

Throughout the project there are two areas of Aboriginal sensitivity, both located along the Hills M2 Motorway. Within these sensitive areas are Indigenous artifacts including rock shelters and carvings. Each item holds significant importance as they represent Indigenous heritage and demonstrate the way of life of the communities who once lived in the area. Neither site is impacted by the construction work along the M2.

**EUROPEAN HERITAGE**

One of the most significant heritage items in the project area is the Maltworks facility located in Pioneer Avenue at Thornleigh and represents one of the first Maltworks building facilities in Sydney, noted in the following case study. Across the project footprint there are also numerous street trees that hold European heritage value. They are significant due to their age and ecological value, while also contributing to the local landscape aesthetically which is important to the community. Most of them are remnant individuals of threatened tree communities such as Blue Gum High Forest or Sydney Turpentine Ironbark Forest. These trees represent vegetation communities that once dominated the local area but have been reduced due to urban development.

Other significant heritage items include heritage listed Canary Island Date Palms located at Pearce's Corner in Wahroonga. These palms are significant as they frame the intersection of the Pacific Highway and Pennant Hills Road as well as mark the commencement of Pennant Hills Road. The palms were originally planted in 1924 and were required to be relocated due to the construction of an additional northbound lane along Pennant Hills Road. In February 2017, the palms were relocated approximately five metres away from their previous position in order to preserve them in their current setting and allow the construction works to progress in the area. The palms remain healthy and are being monitored by the environmental team.
A compound identified in the Environment Impact Statement at Pioneer Avenue in Thornleigh is the site of the former Thornleigh Maltworks, which operated from 1911 until the late 2000s. The site is of state historical significance as it is an early example of the maltings industry in NSW.

The Maltworks was identified as a location for a site compound for the duration of the project. Various strategies have been implemented to ensure the heritage significance of the site is maintained. These initiatives have include:

- Creating an archival record of the manager house onsite;
- Carrying out a test excavation program;
- Carrying out an archival scan of the germination building;
- Fencing and establishing a signage protocol onsite; and
- Inspecting the mitigation measures and the site annually.

The archival scan is an innovative technology that allows for a heritage item to be digitally recorded in its current state. This technology enables the heritage significance to be preserved. A complete scan of the germination building was completed prior to construction work.

Sarah Blagrove, the Sustainability Lead on the project is currently working with the Hornsby Shire Historical Society (HSHS) to put together archival recordings of the Thornleigh Maltworks into a timeline of events, which will be shared with the local community and displayed in the HSHS museum.
The project is committed to robust community engagement throughout the construction process and leaving a positive social legacy for the local community. The project team is delivering on this commitment through industry leading community engagement and education program initiatives.

IN-SITE TOURS
In May 2017 the Community Team established a site tour program catering for highly impacted residents living near the project’s work sites. The aim of the program has been to give these important stakeholders a ‘behind the scenes’ view of work to better their understanding of work schedules, activities and impacts. In 2017, 59 residents participated in the tours at the Southern Interchange, Trelawney Site Compound and Northern Interchange.

PRESENTATIONS
The project understands that different communication channels are required to reach different groups in the community and in 2017 boosted its presentation program. The program involves sending project representatives to key community groups such as Rotary, Probus, retirement villages and hobby groups to deliver a presentation on tunnelling progress, civil work progress and answer any questions which may arise. In 2017, 32 presentations were delivered to about 1690 audience members.
INTERACTIVE TUNNELLING MAP

In July 2017, the project published a new, interactive map on its website. The map is updated weekly to show the location of the project’s 20 roadheaders, tunnelling completed and where work is expected to occur in the next 30 days. Since publication the map has ranked as the second most visited page on the website each month, outranked only by the homepage.

EDUCATION PROGRAM

As part of the project’s commitment to leave a positive social legacy, the team has worked closely with local schools along the NorthConnex alignment to ensure they have access to our project’s science, technology, engineering and mathematics (STEM) experts during construction.

A revised plan for 2017 offered education institutions from preschool through to university opportunities to be involved with the project. These ranged from colouring in competitions to career talks, academic prizes for excellence in STEM to site excursions. In 2017 3080 students or community members from 16 education institutions took part in NorthConnex initiatives including 7 new partnerships. One of the most successful changes to the education program was a reinvention of the Tiny Tunnellers Holiday program. The project team recognised that some parents were having difficulty bringing their child to attend the program at our Project Display Centre and so made the program mobile for preschools and primary schools. This resulted in an additional eight sessions being held in 2017.
COMMUNITY DAY

In September 2017, NorthConnex continued its Community Day initiative, which is based on Lendlease's Community Day program that is implemented around the world annually. Community Day involves personnel across the project to stop work for the day and volunteer within the local community.

In 2017, around 70 staff volunteered at three projects across the project's alignment. Staff assisted with gardening and maintenance at North Rocks Primary School to improve the playground area for students and staff. At Cherrybrook Public School, staff volunteered to repaint handball courts and line marking on the ground, as well as all major doors facing the school’s main quadrangle. The third site was a partnership between Hornsby Shire Council and local residents, with staff and residents working alongside each other to remove weeds from land adjacent to Hornsby Quarry. The two schools were presented with bench seats filled with sports supplies as a further legacy.

“During the school holidays a team from NorthConnex spent a day at our school painting different parts of our grounds, including some doors and lines on the ground. On behalf of the entire Cherrybrook Public School community, thanks to NorthConnex for your support which included donating people-time, paint and everything else associated with painting. We are sure all visitors will notice the spruced up doors, handrails and line markings around the school.”

Jason Miezis, Cherrybrook PS Principal
Loreto Normanhurst is located directly above the NorthConnex tunnel alignment between the Trelawney Street Compound and Northern Interchange. In 2017, the project partnered with the school on several initiatives for 45 Year 5 students, to raise awareness of the project and encourage careers in STEM subjects.

The first activity to be undertaken was a naming competition for the project’s surface miner. The students were provided with information and photos of the surface miner and as holiday homework were asked to think of names which recognised the local area and female achievements in science. Year 5 student Tahlia Moses suggested naming the surface miner after mining engineer Turia Pitt.

“Turia Pitt is an incredible woman just like the surface miner – so strong and powerful that it gets through anything”, she said.

Three student representatives, their parents and teachers were then invited to the Southern Interchange Compound to take part in an official naming ceremony. Surface miner manufacturer, Vermeer, also had a representative in attendance and presented the school with a model of the surface miner.

The second activity completed with the school was an educational talk. The talk was delivered by three female representatives from the project – Environment Manager Rebecca Grant, Sustainability Lead Sarah Blagrove and Site Engineer Casey Lu and covered what the project includes, personal protective equipment, environmental management, noise monitoring, machinery and how they started their respective careers. The students were able to hold rock samples, see how noise monitoring equipment worked and touch a roadheader pick.

The program with Loreto culminated with a site visit to the Trelawney Street Compound. The 45 students were accompanied by parents and teachers and shown inside the compound. This included wearing PPE, receiving a safety induction presentation, walking across the site’s dedicated pedestrian bridge, looking down the 65 metre shaft from a viewing platform and watching a crane lift in action.

CASE STUDY: LORETO NORMANHURST GIRLS SCHOOL

A student from Loreto Normanhurst inspects part of a rock bolt
The size and nature of the NorthConnex project offers great potential to leave a positive legacy for the local community. This can be achieved by hiring staff and procuring items locally. NorthConnex has included this as a key goal and aims to support local business. The project is able to encourage a town atmosphere and encourage engagement with the local economy through a variety of initiatives.

**LOCAL PROCUREMENT**

The project aims to procure items locally to allow the community to benefit from the construction activity and to support local businesses. This is encouraged across the project through inclusion of this commitment into key plans to ensure local markets are given opportunities to engage with the project. This commitment is applied to a range of NorthConnex procurement items; from the choice of local catering to large orders of steel and concrete required for tunnel construction.

**POP UP SESSIONS**

Supporting local business through Pop Up sessions is an initiative that has been developed to assist local businesses and improve interactions with the local community. Community engagement groups and meetings are held at local coffee shops along the alignment, with coffee and afternoon tea provided by the café and all costs covered by the project. This facilitates meetings between members of the project team and community members in a relaxed location where they feel comfortable and encourages residents to try out cafes in their local area. A range of personnel from the project assist with the Pop Ups from engineers through to construction managers and environmental experts. This allows technical questions to be addressed and creates an opportunity to share specific tunnelling knowledge with the community. Construction notifications and updates are also provided.
In support of National Tree Day on Sunday 30 July 2017, the NorthConnex Environment and Sustainability team revegetated a rocky slope beneath Bridge Road at Hornsby Quarry. National Tree Day, an initiative started in 1996 by Planet Ark, aims to encourage people to do something positive for the local environment and to reconnect with nature.

Senior Environmental Coordinator Colm Kennedy said the team was keen to replant the area with native species including Blue Gums, Blackbutts and native grasses. “NorthConnex is committed to minimising impacts on the environment while construction of the new underground motorway link is carried out,” Mr Kennedy said.

Hornsby Quarry is surrounded by native bushland, which is used for mountain bike trails and bush walks. “Dragonfly Environmental and Hornsby Shire Council’s Community Nursery kindly donated a total of 140 trees, shrubs and grasses to the project so the slope beneath the Bridge Road approach to Hornsby Quarry could be rehabilitated.”

“By planting these species now, we hope they will be well established by the time NorthConnex has deposited more than 1 million cubic metres of spoil into the quarry void and the area handed back to Hornsby Shire Council.”

**CASE STUDY: NATIONAL TREE DAY AT HORNSBY QUARRY**
In delivering NorthConnex, LLBJV has the capacity to leave a positive legacy for many years to come. We are providing thousands of workers with new skills for sustainable, long term employment.

Our training and employment targets are designed to upskill our existing workforce, provide opportunities for young people, disadvantaged and under-represented groups, and ensure workers from Western Sydney and the Central Coast are targeted for training and employment to help address the state's skills shortage.

To help us achieve these targets, we have established a dedicated training and employment facility, known as NorthConnex Training Hub (NCXHub). NCXHub maximises local participation in the delivery of this landmark infrastructure project by catering for the delivery of specialised training and education programs.

**ENVIRONMENT AND SUSTAINABILITY TRAINING**

The importance of environmental management and increasing awareness of sustainability is a key focus on the project. Weekly toolbox talks and training sessions include environment and sustainability training, generating increased awareness about the environment and how it needs to be protected, as well as sustainable practices that can be undertaken at work and at home. Topics covered include management of dust, waste, water, noise, vibration, energy use and water consumption. To date, 324 different environment and sustainability training sessions have been completed.

**TAFE AND APPRENTICESHIPS TRAINING**

LLBJV is committed to offering challenging work opportunities, career advancement and skills development to apprentices and trainees. The project's investment in and development of apprentices is building a workforce equipped with the skills required to deliver the project, and will encourage growth and expansion of the construction industry.

LLBJV has set apprentice targets in line with the NSW Government Training Management Guidelines. The project has an overall target of 30 direct apprentices in civil and plant roles. The project has significantly exceeded this goal with about 250 apprentices undertaking training across the project, with the first to complete their apprenticeships in the first half of 2018.

To deliver on the apprenticeship and trainee targets, the project has partnered with Career Trackers, My Gateway and parent company graduate programs.

The Project is facilitating the following apprenticeships:

- RII30915 – Certificate III in Civil Construction – Road Construction and Maintenance;
- RII30915 – Certificate III in Civil Construction – Tunnel Construction;
- Certificate III in Engineering - Mechanical Trade;
- MEM30305 – Certificate III in Engineering – Fabrication Trade;
- UEE33011 – Certificate III in Electrical Fitting; and
- UEE30811 – Certificate III in Electrotechnology Electrician.
The first six NorthConnex workers graduated from 'Applied Shotcrete Underground' at the NorthConnex Training Hub in June 2017. NorthConnex has worked closely with Normet, the supplier of the shotcrete rigs for the project and training simulator, as well as Health and Safety Advisory Services (HSAS), to develop the specialised training program in-house.

Shotcrete is a type of concrete which can be sprayed at high pressure onto a surface to provide stability and is an integral part of tunnel construction and safety. About 23 kilometres of tunnels are being excavated across the NorthConnex project, which will require more than 500,000 cubic metres of shotcrete and concrete to line the tunnels and build the road base.

Across the project we have 12 shotcreting machines and having qualified staff operating this equipment is essential. Shotcrete must be applied at a certain thickness to meet the design requirements and is manufactured at a specially built batch plant at Mount Ku-ring-gai to ensure it meets specifications.

The course included practicing on the shotcrete simulator and prepares staff for qualifications with the European Federation of Applied Robotic Concrete (EFNARC), the international benchmark for underground shotcreting.
Trainer Eamon Whelan demonstrates the shotcrete simulator to Deputy Premier John Barilaro, and Steve Simpson (right) facilitating a training session.

**CASE STUDY: NORTHCONNEX HUB**

The NorthConnex Training Hub was established by LLBJV in November 2016 to ensure that project personnel are upskilled to enable further employment opportunities in the future. The training facility enables the project's training vision and targets to be successfully achieved. It also assists in mitigating the pending skills shortage in civil construction during the next 10 years due to the number of significant infrastructure projects in Sydney, New South Wales and Australia. The training facility is a one-stop learning shop for multiple disciplines including IT, finance, construction and management skills and draws on experienced partners such as TAFE NSW, Mates in Construction and others to deliver tailored training for each individual. Training partners involved in the NCXHub include Mygateway, Aboriginal Resource Group & TAFE.

In its first year of operations, the Hub has facilitated training for about 1500 workers. About 250 apprentices have been recruited across the project to learn and refine their construction skills and Frontline Leadership training to more than 200 people. The Engineering Excellence program has been delivered to more than 70 people.

The top 10 training courses facilitated by NCXHub are:

1. Certificate III Civil Construction;
2. Leadership Programs;
3. Cultural Heritage Awareness;
4. Mobile Plant Operation;
5. Product Quality;
6. First Aid;
7. MATES in Construction;
8. Financial Acumen;
9. Emergency/Crisis Management; and
10. Fatigue and Resilience.

**NORTHCONNEX WILL INVEST $10 MILLION INTO TRAINING AT THE HUB OVER THE LIFE OF THE PROJECT**

**NORTHCONNEX HUB TRAINING TARGETS:**

- **5% INDIGENOUS REPRESENTATION OF STAFF AND LABOUR ACROSS THE PROJECT**
- **20% OF ALL TRADE WORK COMPLETED BY APPRENTICES**
- **OVERALL UP SKILLING OF LLBJV STAFF AND WORKFORCE**
The health and wellbeing of all project employees is a high priority. The project is committed to the health and happiness of its employees, their families and the communities where we live and work. Numerous strategies have been put in place to ensure the project encourages healthy and happy lifestyles.

MENTAL HEALTH

The mental health of employees is just as important as their physical health. The high incidence of depression and suicide in the construction industry makes this issue of critical importance for the Project. NorthConnex provides all employees with access to mental health training and tools in order to support their mental health and general wellbeing. Employee Assistance Programs are also provided to all Project staff through the two parent companies. These programs are designed to help our employees resolve issues or challenges arising in the workplace or in their personal life in a positive way.

PHYSICAL HEALTH

The physical health of our employees is extremely important, particularly due to many onsite tasks requiring manual labour. Several initiatives have been established to help improve the physical health of staff. One of these included engaging Bupa Healthcare to carry out health assessments on site at no cost to staff. Through this scheme, a total of 200 workers had access to health checks in July 2017, looking at a range of health issues including blood pressure, total blood cholesterol, blood glucose and body mass index. The Sustainability Team also launched a SleepFit Program to educate the project about sleep hygiene and identify people potentially at risk of sleep apnoea and insomnia. This was launched across all sites on the second week of July 2017, with just under 400 employees participating in a survey to identify their risk of sleep apnoea and insomnia.

There are also initiatives aimed at encouraging employees to have an active lifestyle. Several programs have been run on site including yoga and boot camp sessions. These healthy lifestyle initiatives were established in October 2015 and have been running successfully since then. Further to this is the inclusion of stretching each morning at some of the prestart meetings. This involves all site workers participating in a 15 minute stretching session that warms them up for the day. Fruit boxes are also supplied to each site to encourage healthy eating.

Other programs include encouraging staff to participate in physical activity fundraising and sporting events with teams participating in events such as City2Surf and Coastrek. The Coastrek event was held in March 2017 and raised almost $45,000 for the Fred Hollows Foundation with groups undertaking 30 kilometre and 50 kilometre walks along the Sydney Northern Beaches. The event is planned again for March 2018.
CASE STUDY: MATES IN CONSTRUCTION

Mates in Construction (MATES) is Australia’s leading construction industry suicide prevention organisation, which focuses on raising awareness, building capacity, providing help and supporting research into mental health. The MATES program uses training to raise awareness of suicide, its contributing risk factors in our industry and how we can all help reduce suicide rates. The importance of raising awareness for this issue aligns with the Project’s commitment to mental wellbeing. NorthConnex has partnered with MATES to deliver their three levels of training; General Awareness, Connector and Asist.

1. General Awareness

General Awareness Training is delivered to at least 80 per cent of workers on site and is completed at the NCX training facility. This training helps to introduce workers to the nature of the problem and provides practical guidance as to how they can assist people showing signs of depression.

2. Connector

Connector Training is provided to those people on site who volunteer. Each Connector is trained to help keep someone in crisis safe, while at the same time connecting them to professional help.

3. ASIST

ASIST Training equips individuals to become an ASIST worker. They can be compared to the first aid officer on site. ASIST workers will talk to a person contemplating suicide with the objective of making this person safe. Using simple skills, an ASIST worker will listen to the person’s concerns and respond to them appropriately to reach a ‘contract’ or a ‘safe plan’ for the worker.

Various fundraising initiatives have also been held to raise awareness of mental health and the facilities that MATES provides. These include being an active participant in Fly the Flag Day, Mental Health Week, on site barbecues and a trivia night with all proceeds going towards MATES.
DIVERSITY & CULTURE

The NorthConnex vision is to leave a positive social legacy for the community as well as the project staff. We have made a number of commitments under the Australian Industry Participation National Framework to achieve this legacy, including increasing cultural awareness and having a target of five per cent Indigenous representation of staff and labour. A NorthConnex Indigenous Participation Plan has been developed as a framework for facilitating Indigenous involvement in the construction of the project. This plan incorporates involvement from key Indigenous partners as well as educational facilities. The project is well on its way to meeting this target with 2.7 per cent of staff and wages as well as 2.8 per cent of subcontractors identifying as of Indigenous heritage.

NORTHCONNEX INDIGENOUS PARTICIPATION PLAN

There are five key objectives in the NorthConnex Indigenous Participation Plan and they are considered important goals of the Project.

1. Building respect and valuing the culture of Australia’s first people;
2. Growing Aboriginal and Torres Strait Islander leadership;
3. Building respectful relationships to deliver opportunities;
4. Collaboration built on respect; and
5. Governance, monitoring and reporting.
CULTURAL AWARENESS AND ENGAGEMENT

Cultural Awareness training has been implemented to provide employees with a greater understanding and appreciation of Aboriginal culture and ensure the support and inclusion of Aboriginal employees and local Aboriginal communities. The program is designed to increase and enrich participants’ understanding of Aboriginal people and develop a respect for cultures. To date, the project’s senior leadership team has participated in the training, with additional training scheduled for 2018.

PROJECT EMPLOYMENT

The project aims to encourage a proactive approach to Indigenous participation through:

- Early development and communication of employment opportunities;
- Targeted recruitment and selection processes;
- Ensuring a receptive workplace via an internal mentor strategy and on-site cultural awareness; and
- Identifying practical solutions and support services for Indigenous employees to maximise retention.

In line with cultural awareness, a target of five per cent Indigenous representation of staff and labour across the project has been set.

STRATEGIC PARTNERSHIPS AND PROCUREMENT

Procurement from Indigenous companies can result in a positive social legacy for Indigenous Communities as it can increase upskilling and employment. Groups such as Supply Nation enable Indigenous companies to be supported with increased opportunities for businesses to supply their goods and services to large public and private sector organisations. The project is committed to identifying and working with the local Indigenous community, business, industry, education and training groups, government agencies and other stakeholders that work within Supply Nation. By offering additional work to local Indigenous companies, we are further encouraging Indigenous employment. The project aims to work with Indigenous businesses and organisations that can assist with Indigenous recruitment, training, mentoring and services.

Through these processes, several partnerships have been established and will be continued throughout the Project including:

- Aboriginal Resource Group;
- Arilla Awareness Training;
- Borger Cranes;
- Kalico Catering; and
- Nallawilli Promotions Paper.

Borgers Cranes used on the NorthConnex project is a Supply Nation certified business
WOMEN IN CONSTRUCTION

Across the project, 9.5 per cent of technical roles such as engineers, design management and acoustic treatment are held by females and the project is keen to improve diversity further. Gender diversity improves decision making and problem solving, brings about more creativity and is important for the work we are doing to build social, economic and environmentally sustainable infrastructure.

The Project is passionate about diversity and strives to be as attractive to women as it is to men and ensure we attract and retain a high level of talent. On the project we provide targeted support and training to boost female participation in the industry and to help to progress them within both our organisations to become leaders in their field. A key objective of the Project is to employ a higher proportion of qualified engineers who are female and surpass the industry average of 13 per cent.

Natalie Carleton is a design engineer on NorthConnex responsible for coordinating design packages for surface work and studied a degree in Civil Engineering at the University of New South Wales as she liked mathematics.

“My role is all about people and relationships and sometimes these are the most challenging and rewarding experiences. In my current team there is approximately 50/50 split of males and females,” she said.

“Engineers are problem solvers and we always need more. You will have opportunities in engineering to solve problems that contribute to society and to the world around us. It’s not often that you can walk or drive through the end result of your hard work.

“In 20 years’ time I would like to be in the shoes of my Design Director who is a female with a wealth of experience in the construction industry and is well respected by the client and consultants.”

Brianna Sparre is part of NorthConnex’s mechanical and electrical team and enjoys the technical aspect of her role.

“I’m a controls engineer, assisting with the design of the NorthConnex tunnel’s Traffic Management Control System – that’s the software and hardware that makes the speed limit signs, tunnel message signs, traffic signals and tunnel closure systems like the boom gates work,” she said.

“I hadn’t considered engineering as an option until part way through Year 12. At the time I thought engineering was all grease and concrete, but it turns out most of the problems are solved on paper before going into the field.

“I find construction projects the most interesting because the challenges are constantly evolving and I get to be involved in seeing major infrastructure projects come together over time, it’s a fascinating process.”

Ms Sparre says students considering engineering should try to participate in STEM programs at school or during the school holidays.

“Look into programs specifically designed to support women entering the engineering space. There are lots of programs out there specifically for girls, but don’t be afraid to step up and try things like programming challenges and building competitions that feel like they’re targeted towards boys.”
CASE STUDY: ABORIGINAL RESOURCE GROUP

NorthConnex has set a target of five per cent of the project’s workforce to be of Indigenous heritage and is on track to meet this commitment with 2.7 per cent of staff and wages, and 2.8 per cent of subcontractors being of Aboriginal or Torres Strait Islander background.

Wayde Buckman and Alister Larder both joined NorthConnex through Aboriginal Resource Group. Mr Buckman is of the Gumbaynggirr and Bundjalung areas and has been on the project for just over a year as a tunneller. He is responsible for operating heavy machinery including roadheaders, rockbolters and concrete agitators.

“I joined the project in October last year through the Aboriginal Resource Group as a groundhog. After three months I was given a permanent role on the project with Lendlease and there are about eight of us now in permanent employment who have come through that pathway. I had previous experience rigging in the Pilbara but it was a massive shock seeing the amount of work underground. I really enjoy my job because it is challenging and there is lots of variety. We are currently training up green guys because there are lots of opportunities in the next decade if you are willing to move away from home. Indigenous communities are very close and often people don’t want to leave, but on projects like this, there are people to support you.”

Mr Lardner works on NorthConnex as part of the bullgang crew.

“I grew up in Kempsey and my people are the Dunghutti people. When the Pacific Highway was being upgraded I got my foot in the door by completing my Certificate III in Civil Construction. In Kempsey there were not many job opportunities so the Pacific Highway was very important. I’ve now worked on other projects such as the Richmond Road upgrade and after NorthConnex I would like to work on Melbourne Metro. My advice to younger people would be to just get out and explore as home isn’t going anywhere and there are lots of opportunities.”

“Aboriginal Resource Group (ARG), as well as our sister company Worka Australia are Indigenous businesses proud to be apart and contributing to the success of the NorthConnex project. We knew from the start that working together on a significant community infrastructure project, that it is more than building tunnels and road systems. It’s the opportunity we have been looking for to showcase Indigenous work talent at its best, with a safety and high performance work culture that has been recognised from managers to peers in creating a great work environment and a strong diverse work team that has each other’s back. With the tunnel team at NorthConnex, ARG has created a Leaders Lead Lead A’s program and a culture that will have proud Indigenous men and women becoming future leaders of more infrastructure projects with Lendlease. We are very appreciative of the relationship and partnership we have built with NorthConnex and the positive ripple effect and legacy it has and will continue to create.”

Cory Robertson, Managing Director
CASE STUDY: ST BARBARA BLESSING AT NORTHERN COMPOUND

The NorthConnex Northern Compound team took part in a ceremony at the tunnel site in May 2017. This blessing at the Compound and was attended by Father Harry Kennedy of St Agatha’s at Pennant Hills, who carried out the blessing.

‘St Barbara is the protector of miners, tunnellers, architects, builders, carpenters, firefighters, masons, construction and electrical workers.’

Father Harry, St Agatha’s Parish, Pennant Hills.
PUBLIC INTEREST

As one of the biggest infrastructure projects in Australia, NorthConnex has been proud to host site inspections, visits and presentations with the following members of Federal, State and Local Government:

- The Hon. Malcolm Turnbull, MP, Prime Minister of Australia
- The Hon. Paul Fletcher MP, Minister for Urban Infrastructure
- Mr Julian Leeser MP, Member for Berowra
- The Hon. Gladys Berejiklian MP, Premier
- The Hon. Andrew Constance MP, Minister for Transport and Infrastructure
- The Hon. John Barilaro MP, Deputy Premier, Minister for Regional New South Wales, Minister for Skills, Minister for Small Business
- The Hon. Matt Kean MP, Minister for Innovation and Better Regulation
- The Hon. David Elliot MP, Member for Baulkham Hills
- The Hon. Philip Ruddock, Mayor of Hornsby Shire Council
- Mr Damien Tudehope MP, Member for Epping
- Mr Alister Henskens MP, Member for Ku-ring-gai
- Mr Scot MacDonald MLC, Parliamentary Secretary for Planning, the Central Coast and the Hunter
The largest event of public interest was the first tunnel breakthrough between the Southern Interchange and Wilson Road Compound on 13 December 2017. The event was attended by Prime Minister Malcolm Turnbull, NSW Premier Gladys Berejiklian, Minister for Transport and Infrastructure Andrew Constance and Minister for Urban Infrastructure Paul Fletcher along with local MPs.

Prime Minister Malcolm Turnbull said the project was on track to shift 5,000 trucks off Pennant Hills Road and return local roads to local communities. “NorthConnex is the missing link between the M1 and M2 motorways and will save motorists up to 15 minutes travel time on each journey as they bypass 21 sets of traffic lights underneath Pennant Hills Road,” Mr Turnbull said. “Getting 5,000 trucks off Pennant Hills Road each day will not only benefit the local community, it will also boost the state and national economies by providing more reliable journeys and shorter travel times for freight operators.”

Premier Gladys Berejiklian said; “The project is set to open in 2019, and in just 18 months workers have carved out 14 of 21 kilometres of rock beneath northern Sydney, and completed almost 64 per cent of mainline tunnelling.”

Federal Urban Infrastructure Minister Paul Fletcher said the project would have huge benefits for local motorists. “Anyone who drives along Pennant Hills Road can tell you this road link is long overdue, and is critical to getting trucks off local roads,” Mr Fletcher said.

NSW Transport and Infrastructure Minister Andrew Constance said 20 roadheaders are working 24 hours a day to make sure the project delivers for commuters. “With tunnelling progressing at around 350 metres per week, we are on track to deliver congestion relief for the thousands of motorists currently stuck in traffic on Pennant Hills Road,” Mr Constance said.
## 2017 FACTS AND FIGURES

<table>
<thead>
<tr>
<th>Action</th>
<th>Requirement</th>
<th>Unit of measure</th>
<th>Target</th>
<th>2017 Tracking</th>
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<td><strong>WATER &amp; WASTE</strong></td>
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<tr>
<td>Spoil reused</td>
<td>WAS-2 Level 3</td>
<td>% - spoil reused / total spoil</td>
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<td>Office waste recycled</td>
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<td>Water reused</td>
<td>WAT-1 Level 2</td>
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<td><strong>STAKEHOLDER/COMMUNITY ENGAGEMENT</strong></td>
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<tr>
<td>Number of complaints</td>
<td>STA-4 Level 2</td>
<td>Number of complaints</td>
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<td>Complaints answered within 5 working days</td>
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<td>% of complaints answered in 5 days</td>
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<td>Number of local businesses involved in the</td>
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<td>Number of different businesses involved</td>
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<td>OOH work respite measures provided (Movie</td>
<td>HEA-1</td>
<td>Number of vouchers from local businesses</td>
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<tr>
<td>tickets, dinner vouchers, hotel etc.)</td>
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<td>handed out to community</td>
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<td><strong>Local Business/Economy</strong></td>
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<td>Number of Pup Up sessions completed at local</td>
<td>HEA-1</td>
<td>Number of Pop Up sessions</td>
<td>10</td>
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<tr>
<td>businesses?</td>
<td></td>
<td></td>
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<td>Money raised for local business through pop</td>
<td>HEA-1</td>
<td>Amount of money raised for the local cafes</td>
<td>$1,000</td>
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<td>up shops?</td>
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<td>Local procurement expenditure</td>
<td>Contract Obligation</td>
<td>% of total expenditure sourced within 20km</td>
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<td>Indigenous company spend</td>
<td>Contract Obligation</td>
<td>Amount of money spent with Indigenous</td>
<td>$2,500</td>
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<td>Companies</td>
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<td>Companies</td>
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<td>Contracts/involvement with Indigenous</td>
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<td>Number of contracts with Indigenous</td>
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<td>companies</td>
<td></td>
<td>Companies</td>
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<tr>
<td>**SKILLS AND EQUAL OPPORTUNITIES FOR</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>WORKFORCE**</td>
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<td>Labour hire arrangements from communities</td>
<td>HEA-1</td>
<td>Number of local labour hires inducted</td>
<td>25%</td>
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<td>adjacent to the project (within 20km)</td>
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<td>Inductions to project (including environment</td>
<td>Contract Obligation</td>
<td>Number of personnel inducted</td>
<td>&gt;400</td>
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<tr>
<td>&amp; sustainability)</td>
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<td></td>
<td></td>
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<tr>
<td>Indigenous Employees (Staff, Direct Workforce</td>
<td>Contract Obligation</td>
<td>% - total workforce / indigenous</td>
<td>5%</td>
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<tr>
<td>&amp; Subcontractors)</td>
<td></td>
<td>workforce</td>
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<tr>
<td>Apprentices on project via Tafe /</td>
<td>Contract Obligation</td>
<td>Number of apprentices</td>
<td>Total 30 for</td>
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<tr>
<td>Productivity Bootcamp (Direct Workforce &amp;</td>
<td></td>
<td></td>
<td>the project</td>
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<tr>
<td>Subcontractors)</td>
<td></td>
<td></td>
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<tr>
<td><strong>SHAPING FUTURE GENERATIONS</strong></td>
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<tr>
<td>No of presentations completed</td>
<td>HEA-1</td>
<td>Number of students involved</td>
<td>&gt;30</td>
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<tr>
<td>No of primary school students educated</td>
<td>HEA-1</td>
<td>Number of students involved</td>
<td>&gt;30</td>
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<tr>
<td>through the program</td>
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<td>Project specific environment &amp; sustainability</td>
<td>KPI</td>
<td>Toolbox topics &amp; number trained against</td>
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<tr>
<td>training for project personnel</td>
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<td>each</td>
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<td></td>
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<tr>
<td><strong>INSPECTIONS &amp; AUDITING</strong></td>
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<tr>
<td>Number of reportable environmental &amp;</td>
<td>KPI</td>
<td>Number of incidents</td>
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<tr>
<td>sustainability incidents</td>
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<tr>
<td>Environmental inspections completed</td>
<td>MAN-6 KPI</td>
<td>Number of inspections</td>
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<tr>
<td>Sustainability inspections completed</td>
<td>MAN-6 KPI</td>
<td>Number of inspections</td>
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<tr>
<td>Greenlight inspections completed</td>
<td>KPI</td>
<td>% of green lights awarded</td>
<td>&gt;85%</td>
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</tbody>
</table>

Target met in 2017: ☑️

On track to meet target: ☑️
2018 STRATEGY

During 2017, the project reached full production within the tunneling and civil construction. Implementation of design allowed for clear targets and objectives to be set, and measuring the performance of the project from commencement.

The strategy for 2018 will be to ensure that the sustainability initiatives continue to operate effectively, and that data is collected and reported on a monthly basis against the targets. This will highlight opportunities of improvement and modifications to particular activities to ensure that the targets are achieved. As the tunneling comes to an end mid-year, there will be a focus on the concrete paving and the mechanical and electrical fit out, with a strong emphasis on sustainable procurement. The project will need to continue to maintain the high standard of work to ensure at the completion of the project in late 2019, the sustainability targets are satisfied.

FURTHER INFORMATION

We invite feedback about all of our sustainability targets and objectives. If you would like further information about this plan and its contents, please feel free to contact the Sustainability team.

- Visit: NorthConnex Community Information Centre
  118 Yarrara Road, Pennant Hills
  Open 9am to 1pm Monday to Wednesday

- Phone: 1800 997 057 (free call)

- Email: enquiries@northconnex.com.au

- Post: Community Relations Team, Locked Bag 1001, West Pennant Hills, NSW 2125