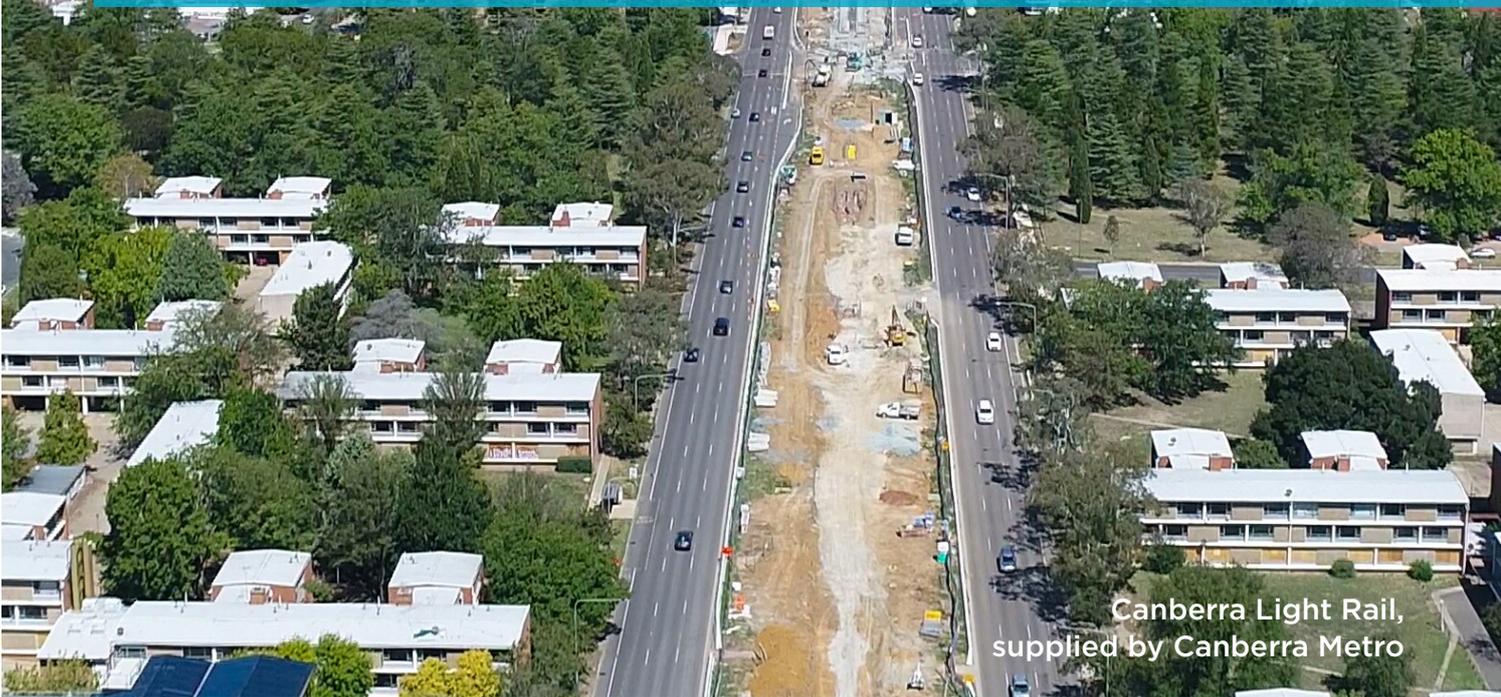


IMPACTS REPORT

2018



Canberra Light Rail,
supplied by Canberra Metro

INFRASTRUCTURE
SUSTAINABILITY
COUNCIL OF AUSTRALIA

ISQA



ISCA IMPACTS REPORT 2018

Infrastructure Sustainability Council of Australia (ISCA)

The Infrastructure Sustainability Council of Australia (ISCA) is a member-based, not-for-profit peak body operating in Australia and New Zealand with the purpose of enabling sustainability outcomes in infrastructure. We do this in the following ways;

- With the Infrastructure Sustainability (IS) rating scheme for planning, design, construction and operations of infrastructure assets,
- Training, capacity building and career-enhancing learning
- Connecting suppliers of sustainable products and services with projects through ISupply,
- Bringing together experts to share knowledge and lift the community of practice,
- Recognising and rewarding best practice.

ISCA's greatest strength is our community of engaged stakeholders – we have a great deal of expertise within our network of members. We position ourselves as a network for collaboration, discussion and education. Our regular events, conferences and seminars facilitate knowledge sharing, and enable experts to get together in a focused environment.

We support industry through these core outputs:



Assurance

- Ratings
- Support/advisor
-



Capability

- Training
- Professional Accreditation
- ISupply



Community

- Membership
- Awards
- Events
- Advocacy

The Infrastructure Sustainability (IS) Rating scheme facilitates the ratings of infrastructure projects and assets. The IS Rating scheme is Australia and New Zealand's only comprehensive rating system for evaluating sustainability across planning, design, construction and operation of infrastructure.

This ISCA Impacts report showcases some of the exemplar case studies, lessons learned, and highlights the positive impact the infrastructure sector is making though delivering more sustainable outcomes for people and planet.



THE ISCA COMMUNITY

A look at our current members



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ISCA's IMPACTS

Since the first project registered for an Infrastructure Sustainability (IS) rating in 2012, ISCA has had a positive impact on the infrastructure industry by rewarding and recognising those that excel beyond business as usual to bring about more sustainable outcomes.

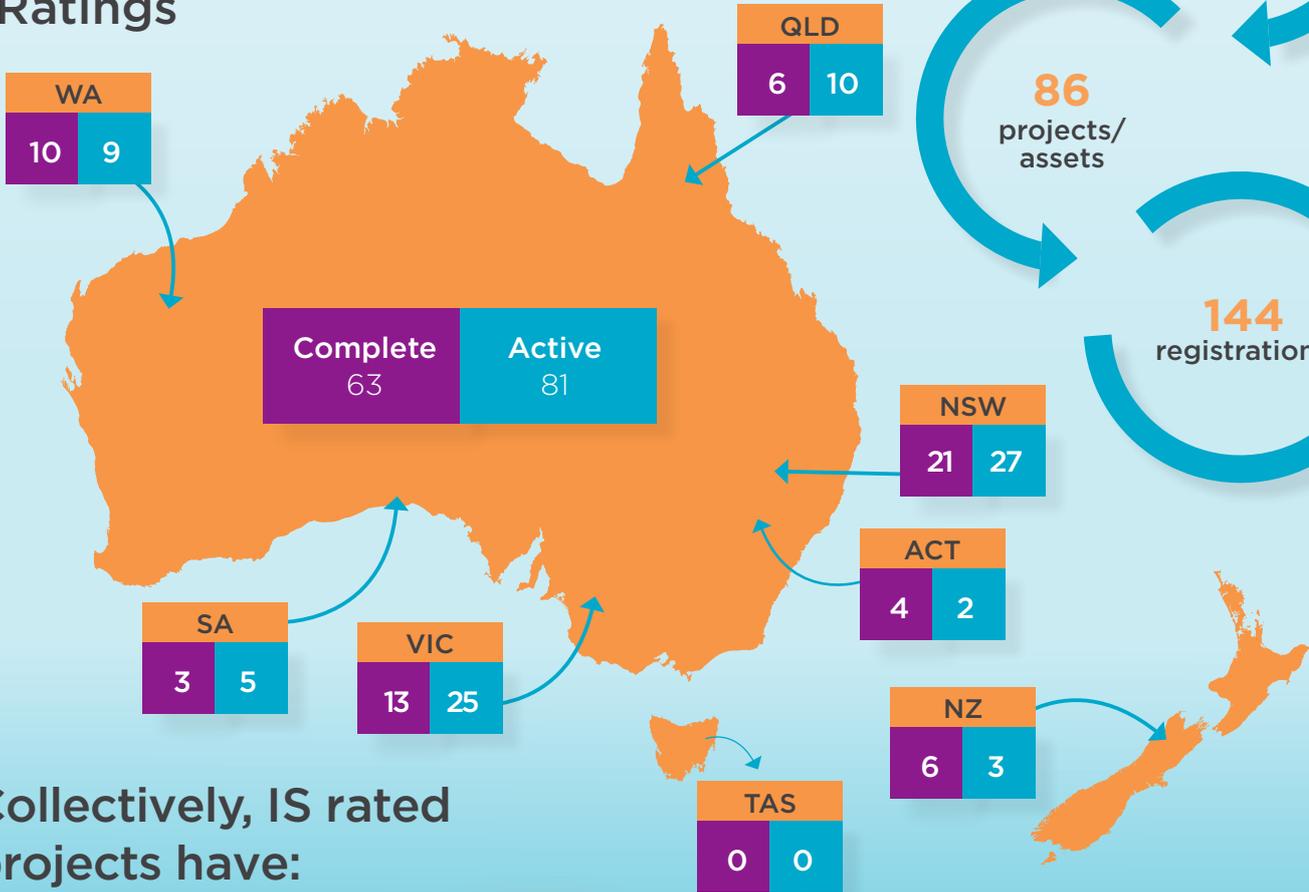
Trends and traction
the IS rating scheme

Capital value
\$97.87
billion

86
projects/
assets

144
registrations

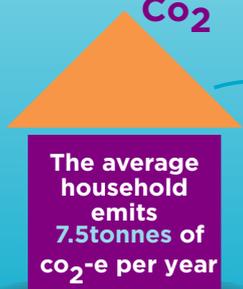
Ratings



Collectively, IS rated projects have:

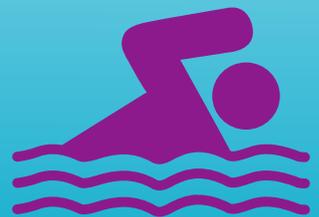
avoided 18,751,508
equivalent tonnes of

CO₂



That's 2.5 million homes,

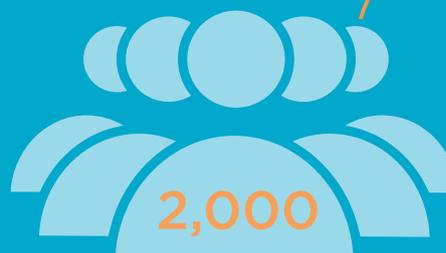
equivalent to the population of Brisbane's household energy for a year.



Reduced material use by 74% compared to business as usual
Which has equivalent environmental benefits to



Empowered over



sustainability champions through training and thought leadership events



CHAIR'S MESSAGE

By David Singleton AM



What are the best infrastructure investments to make? Is it based on economics, or resilience, or both?

Our infrastructure investment decisions matter enormously if infrastructure is to be long lived, so how can we select infrastructure investments that are optimum? How do we determine what would be the best investments to make?

Projects are generally selected on economic grounds, but they should also be meeting 'other criteria' including the ability of the infrastructure to restore, regenerate and increase social, cultural, natural and economic capital.

This 'other criteria' is the focus of work being undertaken by the Infrastructure Sustainability Council of Australia (ISCA), who in 2018 will launch version 2.0 of the IS Rating Scheme, which provides a basis for planning of infrastructure - not only how it rates from a sustainability point of view, but also provides input into how we should best plan, design and operate this piece of infrastructure.

It's widely agreed that infrastructure (such as transport, water, energy, communications) underpins our ability to live in cities and our quality of life. There is a known and stated need for investment in infrastructure and as we sit in the Age of Anthropocene (a new geological age defined by the global scale of humanity's impact on the Earth) - which places new requirements on our infrastructure - never has it been more pertinent that our infrastructure investment decisions matter enormously if infrastructure is to be long lived.

An unfortunate reality across the globe is that infrastructure delivery often becomes a hostage to political agendas and therefore there are some questions that can and should be asked about whether the infrastructure we select is optimum.

However, how do we know if an investment is optimum? How can we select infrastructure investments that are optimum? How do we determine what would be the best investments to make?

There is some understanding in Australia that we should be basing investment decisions on economic grounds (that is, does project A deliver better benefit in terms of cost than project B), however this may not be the best way to choose between certain projects.



There may be other goals or other criteria that we are seeking to achieve with our investment. It could be that a larger number of smaller projects would be preferable to one or two very expensive projects.

Therefore, we should ask: what are the ‘other criteria’ that these projects should be meeting?

More than half of the world’s people live in cities, and have just one planet’s worth of material resources to share around. This necessitates that we must define a new set of expectations and performance criteria for infrastructure investment.

Rather than settling for doing “less bad”, such as less environmental destruction or social disruption, we must aim from the outset to do more good.

This net-positive approach requires us to restore, regenerate and increase social, cultural, natural and economic capital.

A good example is Bishan Park on the Kallang River in Singapore. Formerly a channelled stormwater drain, this collaboration between the national parks and public utility agencies has recreated significant habitat while providing flood protection and an exceptional recreational space. All this has been achieved in an extremely dense city.

Looking into the future, in transport, a net-positive motorway might prioritise active transport and make public transport central by design. It might send price signals based on the number of passengers, vehicle type (such as autonomous or electric) and vehicle ownership (shared, for instance).

A core part of the switch to net-positive infrastructure is the realisation that resilience and robustness are different things. Historically, robustness has been central to infrastructure planning.

However, robustness relies on assuming that the future is more or less predictable. In the Anthropocene, that assumption no longer holds.

Building in resilience

Infrastructure must be at its core flexible and adaptable. This could include, for example, phasing infrastructure investment and development over time. Current analysis is biased toward building big projects because we assume our projected demand is correct. Therefore, we expect to reduce the overall cost by building the big project now.

However, in a more uncertain future, investing incrementally reduces risk and builds resilience, while spreading the cost and impact over time. This approach allows us to monitor and amend our planning as appropriate. It has been shown to save water utilities in Melbourne as much as AUD\$2 billion.

Aligning with the idea of flexibility, adaptability, net-positive - or infrastructure that restores, regenerates and increases social, cultural, natural and economic capita - is work being undertaken by ISCA.

2018 is seeing the launch of Version 2.0 of ISCA’s IS Rating Scheme. This augmented rating scheme provides a basis for planning of infrastructure - the basis for determining not only how it rates from a sustainability point of view, but also to provide input into how we should best plan, design and operate this piece of infrastructure ... moving back up the planning and design decision tree.

As part of ISv2.0 development, a planning rating has been investigated, which will focus on the decision-making processes applied by infrastructure proponents to reward projects that are the result of robust appraisals.

Regulatory reform is another key part of what’s required to enable public and private investment in better outcomes.



In the United States we are seeing strides in the right direction, with their government driven National Mitigation Investment Strategy.

Major disasters and extreme weather events continue to test the nation's ability to adapt and recover. Many organisations have accepted the challenge to make communities and critical infrastructure less susceptible to these hazards, however they all have differing approaches, funding sources, mandates, and requirements for investing in efforts to mitigate disaster risk.

The National Mitigation Investment Strategy aims to support the alignment of pre- and post-disaster mitigation investments. It could ultimately help the US federal government enhance national resilience for future disasters, by increasing the effectiveness of investments in reducing disaster losses and increasing resilience. It could also provide strategic planning considerations for the federal government, as well as state, local, tribal and territorial entities and the private sector in making resource allocation decisions.

This approach – a coordinated one – is vital in the selection of infrastructure investments that are optimum.

Understanding the nexus which exists between ‘sustainable infrastructure’ and ‘infrastructure sustainability’ could then be utilised as the framework to identify more of the ‘right’ projects in which to invest.



Infrastructure sustainability frameworks enable more effective and efficient planning, design and delivery because so many of the key issues are inherently identified throughout the process. Systematic deployment of ISCA's 'infrastructure sustainability' scheme in asset planning and - in parallel - across the management of current assets, can result in cities, policy makers, planners and operators quickly understanding what a smart, resilient and healthy city might look like. 🌍

**David Singleton is an expert in sustainability and is currently Chairman of Infrastructure Sustainability Council of Australia and Chairman of Swinburne University's Smart Cities Research Institute Advisory Board. He undertakes a number of other roles in relation to cities and infrastructure, seeking outcomes for a better world. He is an alumni of Arup with 40plus years service).*

**This article is an updated version of an original article co-written by David Singleton and published on TheConversation.com*



CEO'S MESSAGE

By
Ainsley Simpson



Infrastructure is a fundamental building block to a functional vibrant society. It drives economic growth and productivity, enhances societal wellbeing through connectedness and job creation, and stimulates greater appreciation and management of our natural environment.

In recognising our role in this powerful dynamic, the Board has directed that we visibly communicate the impact that ISCA is enabling for the entire infrastructure value chain. Our partners consistently share with us how we are co-creating value; and also, where we can do better. We are becoming an even more intentional purpose-driven peak body; ensuring that for each action we take, our impact for industry and all communities, is magnified.

The past year has been one of considerable growth and change. Our traction, industry engagement and team have increased in direct response to the infrastructure industry's evolving needs and expectations. The reach of our impact is also widening and in future years, with industry's continued support, this progress is set to soar.

OUR IMPACT

Over the past 12 months, ISCA certified 12 projects with a capital value of \$11.09B. These assets have created cumulative uplift in customer experience for 1.56B infrastructure users, be they commuters, community or consumers; reported a 70.4% reduction in carbon emissions and enhancement of 89ha of natural habitat. From an economic perspective, there have been no less than 15,842 construction and 1,282 operation phase jobs catalysed. Across the value chain, sustainability capability has been bolstered and knowledge has been proactively shared to over 2000 sustainability champions across our network through training and events.

IS International, with encouragement from several multi-lateral development bank's, was launched in late 2017. This enables ISCA to extend our impact well beyond our current ANZ market; enabling communities in other regions to share in the tangible benefits which arise from prioritising sustainability, building capacity and measuring performance.



The release of the next evolution of the IS rating scheme (Version 2.0) is a significant milestone. It is one that signals a shift in sustainability performance benchmarks driven by industry commitment. It is also a timely recognition that if you are going to create virtuous change and make informed investment decisions; the starting blocks are in the planning phase of the lifecycle. V2.0 is a phenomenal industry outcome made possible because all the sectors we serve expect more, and our communities and our environment deserve more.

Our Outcomes

We bring people together to accelerate long lasting change. Our new strategies align with our quadruple bottom line framework; and we will be reporting our contribution to the United Nations' Sustainable Development Goals (SDGs) and 2030 targets agreed by all UN members in January 2016.

	Prosperity		Planet	People
	Government	Economic	Environment	Social
Impact (Long term)	Progressive industry policy, processes and practices through powerful partnerships and collaboration	Improved economic inclusivity with infrastructure that delivers for communities and the environment	Reduced greenhouse gas emissions and greater investment in climate-resilient infrastructure to enhance ecosystem integrity	Empowerment of the infrastructure value chain, through procurement, workplace well-being and community engagement
Outcomes (1-3 years)	Evidencing industry contribution to achieving the SDG's	Improved whole of life outcomes from planning through better business cases that consider non-financial values	Determining the net zero trajectory for infrastructure	Growing sustainability awareness and capability to deliver improved whole of life outcomes

OUR STRATEGIES

ISCA is fueled by a passionate team who are willing to tackle challenges that are bigger than those that we each can tackle individually. This is only made possible because everything our empowered team does is achieved through collaboration.

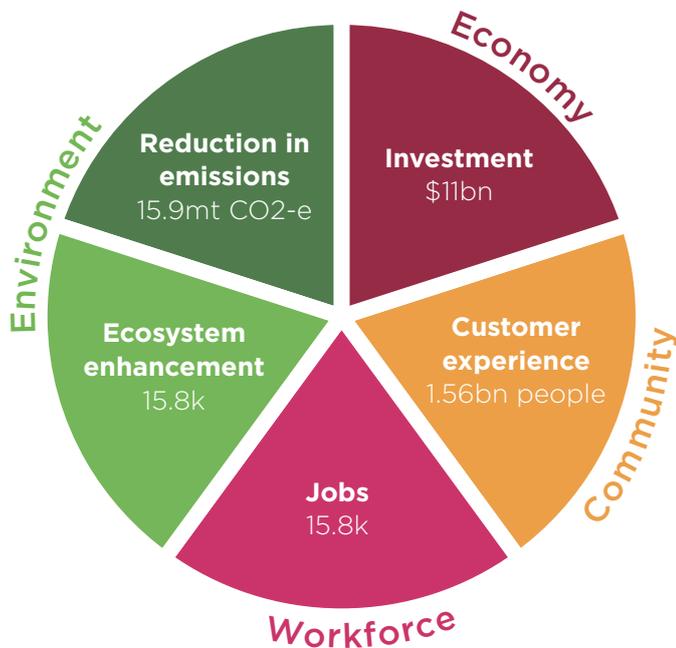
ISCA is channelling our efforts into 4 focused inter-connected strategies which will benefit the entire value chain. These respond to the trends driving our industry, as these are most important to our members and built environment stakeholders.

Leadership • Capability • Innovation • Activation

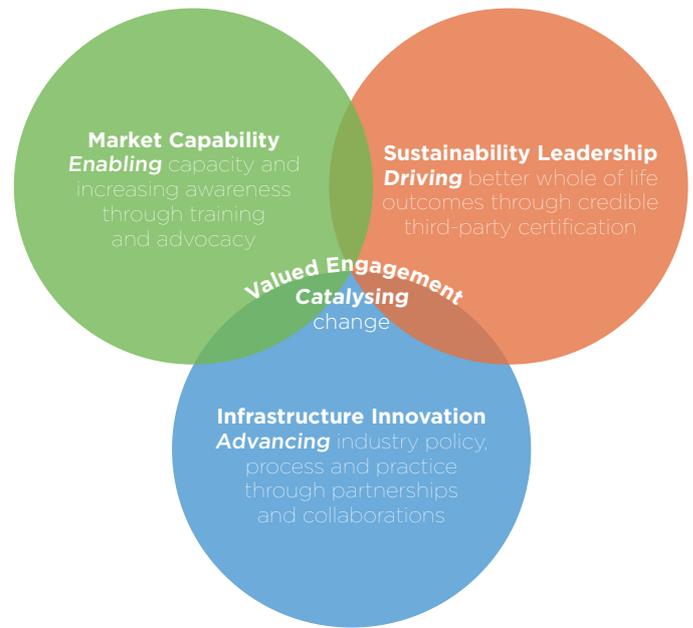


In order to deliver on these strategies across our chosen markets, our tools, engagement and approach will be adjusted to focus on these aspects through our value creation process. Our team and supporting governance structures will be directly reflective of each goal area.

Our impact



Our markets



DELIVERING ON OUR PURPOSE

ISCA will be building on the exceptional sustainability impacts that have been enabled by partnering with industry; and will continue to champion improved outcomes with our growing member base.

We are committed to delivering on our purpose: Enabling people and organisations to deliver better infrastructure through planning, design, construction and operations for our all communities. This will come to life through our culture of value creation which is founded on our core values:

Collaboration • Passion • Change • Knowledge

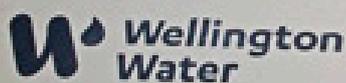
OUR FUTURE

Our focus is on enabling an even more empowered infrastructure value chain that actively drives tangible positive change across the transport, utility and social infrastructure sectors. Our strategy ensures that ISCA is a trusted assurance partner across the infrastructure lifecycle, a reliable data and knowledge source and a collaborative advocate for leading the emerging culture of sustainability in infrastructure. I am truly looking forward to this next leg of the journey together with our team, members, and built-environment partners -

Smarter when we listen, stronger when we share.

CHALLENGING TRADITION.

AN INNOVATIVE APPROACH TO PROVIDE EMERGENCY WATER FOR 400,000 PEOPLE



Cardno New Zealand's Technical Director of Infrastructure Strategy, **Antony Cameron** gives a 101 on water supply resilience.

MORE PEOPLE, MORE FREQUENT CLIMATE EXTREMES

Modern infrastructure is under pressure to perform, but funding for infrastructure upgrades and renewals is stretched.

Water infrastructure is one of many groups competing for funding to meet these challenges, especially in the emerging field of disaster resilience.

Access to sufficient quantities of fresh water is also a key ingredient in preventing major outbreaks of disease following a significant disaster.

The Wellington region is not alone in sharing competing infrastructure challenges. Driven by a global need to develop smarter outcomes against the backdrop of financial and time based constraints, Cardno decided to challenge traditional resilience thinking.

This led to the development of a low-cost, twelve-month water resilience strategy that has achieved a major step change in levels of service for more than 400,000 residents in the Wellington region.

Continuous improvement of water services through latter parts of the 20th century has led to both complacency that water will always be available, and complete dependability on emergency services to provide an alternative when it isn't. This dependability is the Achilles Heel for many communities where few or no alternatives exist to the normal reticulated water supply.

Problems are exacerbated in Wellington where water treatment plants are located significant distances from major urban centres. In-between lies hundreds of kilometres of pipeline, susceptible to many natural hazards including landslides, liquefaction, fault rupture and urban debris.

Access to sufficient quantities of fresh water is also a key ingredient in preventing major outbreaks of disease following a significant disaster.

How long should communities be prepared to wait for basic water services?



“The typical approach to water supply resilience in many cities is one of ‘we must be there in the event of a disaster.’ The problem with this approach is people fundamentally dislike being let down, especially when we’re talking critical infrastructure”, says Antony Cameron, Cardno NZ’s Technical Director of Infrastructure Strategy. “We decided to approach things differently. What if we communicated pragmatically? And said ‘we can’t, and won’t be there in the event of a disaster.’”

Cardno turned to the use of leading cellular analytics to understand how people moved in and around the region based on real cellular data. This data helped confirm that the lack of transport across the region would effectively create 17 miniature ‘islands’ until these transport routes were restored. The team further found that people may be walking home for up to four days.

This information was a key to informing the community-centric approach of the Community Infrastructure Resilience Programme. “The data told us we can’t be there, and even if we could the response may be patchy. This was a key foundation in our community-centric approach,” says Antony. “We recognised we needed to empower communities with resilient water services within each island, while also planning for a utility-led response”.

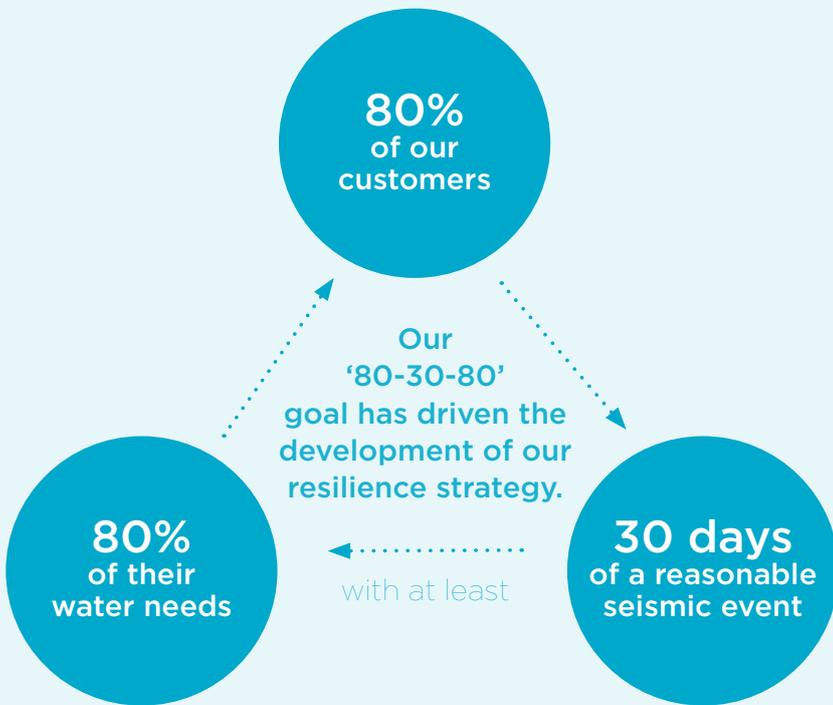
This led to the first phase of resilience work to investigate and establish water sources in each island. Cardno first completed extensive hydrogeological investigations into the regions ground and surface water.

We were targeting a service level objective of providing 20 litres of water for every person, every day, within 1,000 metres of every Wellington home.

This meant we needed to identify around 22 new water sources each capable of producing water at a rate of roughly 350,000 litres per day. Once suitable water sources had been identified, Cardno worked with local suppliers to design and build 22 containerised water treatment systems called ‘Community Water Stations’. Each system is self-contained, sitting in hibernation at the site, awaiting rapid setup following a significant earthquake. Each unit can also be transported around the region to support other areas if it is not required at its own site.

The final piece of the puzzle involved procuring over 400 water bladders for transport and storage of water after an earthquake. These water bladders are normally stored in water stations or around islands, each about the size of a large rolled up sleeping bag. Their small size and light weight make them ideal for emergency applications. The bladders will be accessed after the event and filled with water from reservoirs and water stations, creating an ‘above ground’ mobile water network. They form an integral part of the requirement to provide water within 1,000 metres of every Wellington home.

How does this empower communities?



Cardno's innovative approach to resilience challenged the way cities can deliver high-value, low-cost, resilient infrastructure against the backdrop of many emerging infrastructure challenges.

Normal infrastructure services will cease operation for an extended period of time following a significant earthquake so the community will naturally turn to local alternatives. The combination of assets and integrated emergency planning delivered by Cardno provides communities with the tools and information they need to get by, with or without emergency services. Together, these communities can access existing water reservoirs as well as work with limited emergency services to open and operate Community Water Stations.

This means that each island is able to provide the 20 litres per person of water needed to get through the emergency. The community will also access stored water bladders, unrolling them in vehicles such as trucks or utes, and filling them with water. These vehicles are then used like a water tanker, transporting water to larger stationary water bladders that are set up around each community. Water mobility also means the community can adapt to specific needs; maybe a rest home or medical facility needs water which it would otherwise be unable to access.

Cardno's innovative approach to resilience challenged the way cities can deliver high-value, low-cost, resilient infrastructure against the backdrop of many emerging infrastructure challenges. No matter the size of the earthquake, and no matter the location, each community within 17 'islands' can access tools and maintain emergency water supplies until network services are restored to homes around the region. 🌐

VIRGIN AUSTRALIA TAKING THE SUSTAINABLE FUEL AGENDA TO NEW HEIGHTS

Sustainable aviation fuels derived from biomass (plants, trees, algae, waste and other organic matter/ bio-oils) offer the single largest opportunity to reduce emissions for airlines in the medium term whilst ensuring long-term fuel security for the industry.

*By Robert Wood,
General Manager Group Sustainability*

At a global level, the aviation industry is committed to reducing its greenhouse gas emissions and has set a target of carbon neutral growth from 2020. The use of sustainable aviation fuels will significantly contribute towards achieving this target.

The Virgin Australia Group (the Group) has been actively supporting the development of sustainable aviation fuels since 2008, including:

- **participating in domestic and international policy discussions;**
- **working with State and Federal Governments, along with industry groups, on ways to stimulate the production of these fuels in Australia;**
- **undertaking studies on fuel production pathways and feedstocks; and**
- **holding direct negotiations with sustainable aviation fuel producers**

However, despite these efforts, and those of many others in the industry, sustainable aviation fuels are not currently produced in Australia.

The Group consulted with a number of sustainable aviation fuel companies and identified that providing a strong demand signal combined with a long-term off-take arrangement was the best way to attract investment to sustainable aviation fuel projects in our region.

In March 2016, the Group, in partnership with Air New Zealand, released a Request for Information (RFI) to procure 200 million litres of sustainable aviation fuels for a period of 10 years, starting in 2020. The RFI generated strong local and international interest. Many submissions were received and assessed through a detailed due diligence process to short-list companies.

Following initial discussions with these organisations, further detailed technical analysis and financial due diligence was conducted. Given that the cost of traditional jet fuel today is not the only appropriate measure to benchmark these sustainable aviation fuels against, the Group looked at the overall value that sustainable aviation fuels would bring to our business between 2020-2030, and has created a new contracting approach for the supply of these fuels.

Through the RFI process, the Group began to develop a clear understanding of the total costs of these fuels, however the re-certification of the fuel before incorporation into the fueling infrastructure, as well as the logistics of the blending method, remained a barrier.

Following this identified gap in knowledge, the Group entered into a partnership with the Queensland Government and a sustainable aviation fuel supplier, Gevo Inc. to test the supply-chain readiness for sustainable aviation fuels in Australia.

This project will see the supply of sustainable aviation fuel into the Port of Brisbane, which will be received over the course of the next 12-24 months. This will be the first time that any airport in Australia will have sustainable alternative fuel supplied through the regular fueling infrastructure.

This fuel is produced using the Alcohol (Isobutanol) to Jet fuel pathway and will be certified to ASTM D7566. The insights generated from this project will enable the Group to move forward in our procurement of sustainable aviation fuels, as well as increasing the attractiveness of investment in this industry in Australia. This project will also identify opportunities for improvements in the current processes and infrastructure to ensure Australia is ready for these fuels, making our region attractive to investors.



The purpose of this project is to help us better understand the logistics and cost of supplying sustainable aviation fuel into the current fuel infrastructure at Brisbane Airport. This includes blending and certifying the fuel to Jet A-1 and transporting it into the Joint User Hydrant Installation (JUHI), which is the infrastructure that holds the fuel at Brisbane Airport.

This infrastructure is jointly owned by four fuel companies (VIVA, AirBP, Caltex and Mobil) and Viva manages the JUHI that supplies domestic, international and military aircraft at Brisbane Airport.

Over the past several months, the Group has been working with multiple stakeholders to ensure that sufficient infrastructure, process design and skills exist to allow this industry to develop moving forward. The key to the success of the project will be in identifying the safest and most cost effective way to blend, certify and supply these fuels into the JUHI and ultimately into all aircraft uplifting fuel. 



CLEAN ENERGY OPPORTUNITIES

WITHIN REACH FOR AUSTRALIA'S
INFRASTRUCTURE SECTOR

The Clean Energy Finance Corporation (CEFC) has identified enormous potential for improved sustainability through investment in clean energy opportunities within Australia's infrastructure sector.



Established by the Australian Government in 2012, the CEFC works to increase investment in emissions reduction.

Australian infrastructure is a focus for the CEFC because the sector accounts for almost half the nation's greenhouse gas emissions, driven largely by fossil fuel consumption in energy generation and through transport and industrial process emissions.

CEFC CEO Ian Learmonth said the scale of infrastructure projects, and their longevity, mean they are well placed to benefit from investment in clean energy technologies

to lift energy efficiency, increase productivity and lower emissions including through fuel switching and electrification of transport. "It is absolutely critical that the infrastructure assets of today contribute to the overall emissions reduction task that we are facing. Through our investments, the CEFC is targeting comprehensive and sustained improvements to the carbon footprint of our infrastructure assets," Mr Learmonth said.

In the past year the CEFC has committed \$300 million to two major infrastructure programs, to demonstrate the potential for emissions reduction in the sector - \$150 million in equity towards the IFM Australian Infrastructure Fund and \$150 million in debt finance towards the sustainable development of the nationally-significant Moorebank Logistics Park.

Delivering a step change in infrastructure emissions

The \$12 billion IFM Australian Infrastructure Fund, managed by IFM Investors, has Australia's largest portfolio of high-quality infrastructure assets including, Ausgrid, Brisbane Airport, Melbourne Airport, Sydney's Port Botany and the Port of Brisbane.

The CEFC estimates that just a five per cent improvement across the assets in the portfolio would abate almost 69,000 tonnes of CO₂-e annually. This is equivalent to removing 14,775 cars from the road each year or providing electricity to 7,450 homes a year.

The CEFC's commitment to the fund involves working with IFM Investors to enhance benchmarks and transparency around infrastructure emissions to deliver a step change in the emissions profile of Australia's infrastructure.

While the agreement with IFM Investors is in its early stages, the kinds of initiatives likely to be implemented include; installing on-site solar PV and battery storage solutions and transitioning car fleets to electric vehicles over time. They are also likely to involve using smart management systems which monitor asset performance and assist with reducing energy consumption and optimising logistics and supply chains.

Fuel switching for emissions reduction

The CEFC's finance for Moorebank Logistics Park, being developed by leading freight and logistics company Qube Holdings Limited, is aimed at demonstrating the potential for emissions reduction through fuel switching.

The CEFC has committed up to \$150 million through a seven-year bilateral term debt facility to assist in providing medium-

term finance for the staged construction of the terminal.

The Moorebank project will switch the movement of 1.55 million freight containers at Port Botany from road to rail, with an estimated annual abatement of more than 110,000 tCO₂e in transport-related emissions.

The switch to rail transport, when operating at scale, will cut an estimated 3,000 truck journeys a day from Sydney's road network, particularly the M5. It will also reduce the number of regular Sydney-Brisbane and Sydney-Melbourne truck freight trips.

The Moorebank Logistics Park will be developed across 243 hectares in south-western Sydney, taking advantage of its location near the Southern Sydney Freight Line, M5 and M7 motorways and in an area of rapid population and economic growth. The project will incorporate large-scale renewable energy technology expected to generate 65,000 MWh/year - enough to power over 10,000 homes.

Despite its massive scale - operating across a site the size of Sydney's CBD - the freight and energy efficiencies delivered via the Moorebank Logistics Park are expected to result in net emission reductions totalling more than 2 million tonnes of CO₂-e over a 40-year period.

Excellent standards for clean energy outcomes

The CEFC finances infrastructure projects as part of its Sustainable Cities Investment Program which aims to invest \$1 billion into clean energy initiatives in Australian cities over 10 years.

Its investments encourage increased transparency around emissions performance, through asset-level energy and emissions performance reporting and benchmarking against internationally-accepted science-based targets.

When the CEFC is assessing finance for infrastructure projects it typically asks that ISCA ratings of "Excellent" be sought for the relevant assets.

The CEFC is looking to finance measures that enable an increased focus on renewable energy and energy efficient technologies at the individual asset level. Its investments target best practice and market leading design, construction and operations. Both equity investment and tailored debt finance are available and each request for finance is assessed on a case-by-case basis. 

Learn more about the CEFC and its investments at cefc.com.au

ADDRESSING SUSTAINABILITY FROM THE START



At Arup, “We shape a better world”, so sustainability is at the heart of all we do.



We believe that delivering sustainable outcomes for both current stakeholders and future generations will make our business stronger in the long run.

Like ISCA, we recognise that sustainable outcomes on projects are a result of collaboration between stakeholders, from planning through to construction and operation phases.

We played a key role in developing the initial Infrastructure Sustainability rating tool, providing us with in-depth knowledge, from its development to its context within the wide range of sustainability frameworks. Arup's leading sustainability infrastructure professionals were involved in developing Version 2.0, and we are ISCA verifiers and trainers, having trained more than 200 Infrastructure Sustainability Accredited Professionals (ISAPs).

Case study: Port Drive Upgrade, Brisbane

Arup has significant experience in the ISCA rating tool projects including the Port Drive Upgrade, Melbourne's Metro Tunnel Project, Parramatta Light Rail and Canberra Light Rail.

In 2017, the Port Drive Upgrade project was awarded a certified IS Design v1.2 'excellent' rating. This was the second road project in Queensland to receive the rating, and is currently the highest scoring of all projects registered in the state.

The Arup team was committed to meeting sustainability commitments for activities across the project lifecycle, not only those in our direct responsibility. Together with Port of Brisbane Pty Ltd (PBPL), and Principal Contractor Seymour Whyte Constructions (SWC), achieving an ISCA rating was a core objective in delivering the project. Integrating the sustainability requirements into the design and construction ensures commitments are met efficiently.



A robust and integrated process was carefully considered for delivery of the sustainability objectives across design, procurement, construction, and operation. Implementation and milestones were aligned with the engineering and delivery programme to achieve success through collaborative and seamless decision making. Key to achieving the Design

rating was the Australian first use of the innovative Quickcell wide flange Super I girders. Developed by Quickcell Technology Products and Arup, the new type of beam can reach spans of up to 46m, longer than the standard 32m Super T girder. Using the longer girders on the Lucinda Drive bridge component of the project reduced materials, construction and

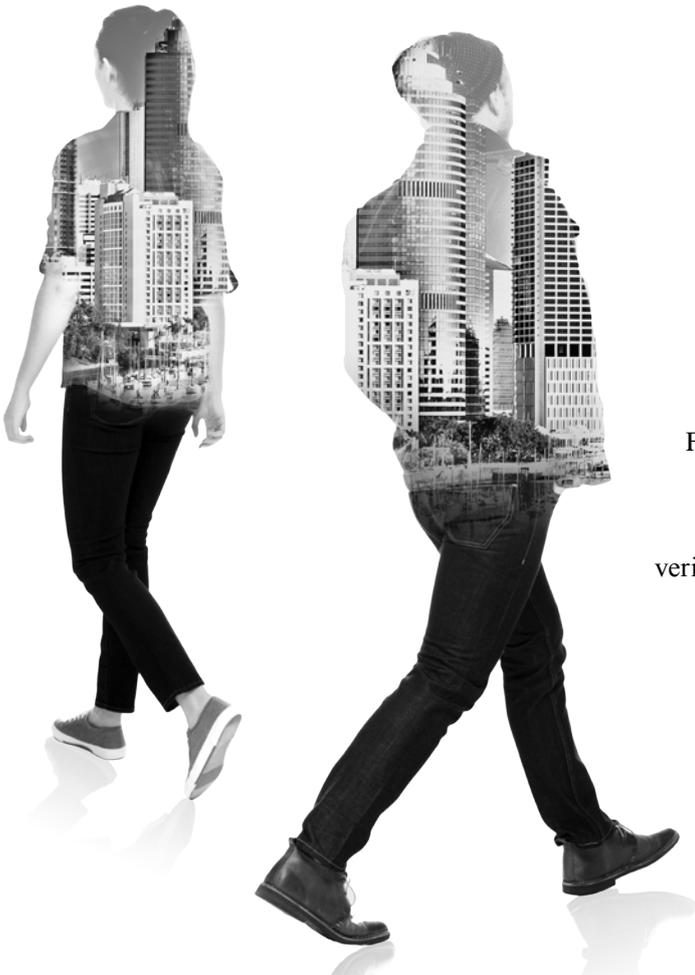
maintenance costs, while also mitigating major safety and constructability issues. Another significant feature of our design was the use of 50,000 tonnes of sustainably-sourced Enrobés à Module Élevé Class 2 (EME2) asphalt, a binder (bitumen) rich mix which produces a stiffer asphalt with remarkably good workability.

ARUP

This innovation resulted in a reduced asphalt thickness leading to the reduction of 99,000 tonnes of asphalt, which in turn delivered a 32% reduction in lifecycle greenhouse gas emissions between the preliminary design and detailed design. We realised time savings of 80 days needed to lay the asphalt along with construction fuel savings due to less plant movement. This rating has also positioned contractor Seymour Whyte Constructions to receive an IS As Built v1.2 'excellent' rating upon completion of construction, due mid 2018. Arup offers a holistic

environmental and sustainability consulting service, which is integrated globally with our engineering, design and planning/economics services. Our global team of specialists offer services in developing policy, assessing impact, creative design and implementation, gaining regulatory approvals, reporting publicly, stakeholder consultation, managing risk and controlling costs.

At Arup, we believe it takes commitment to bring long-term change. The future depends on it. 



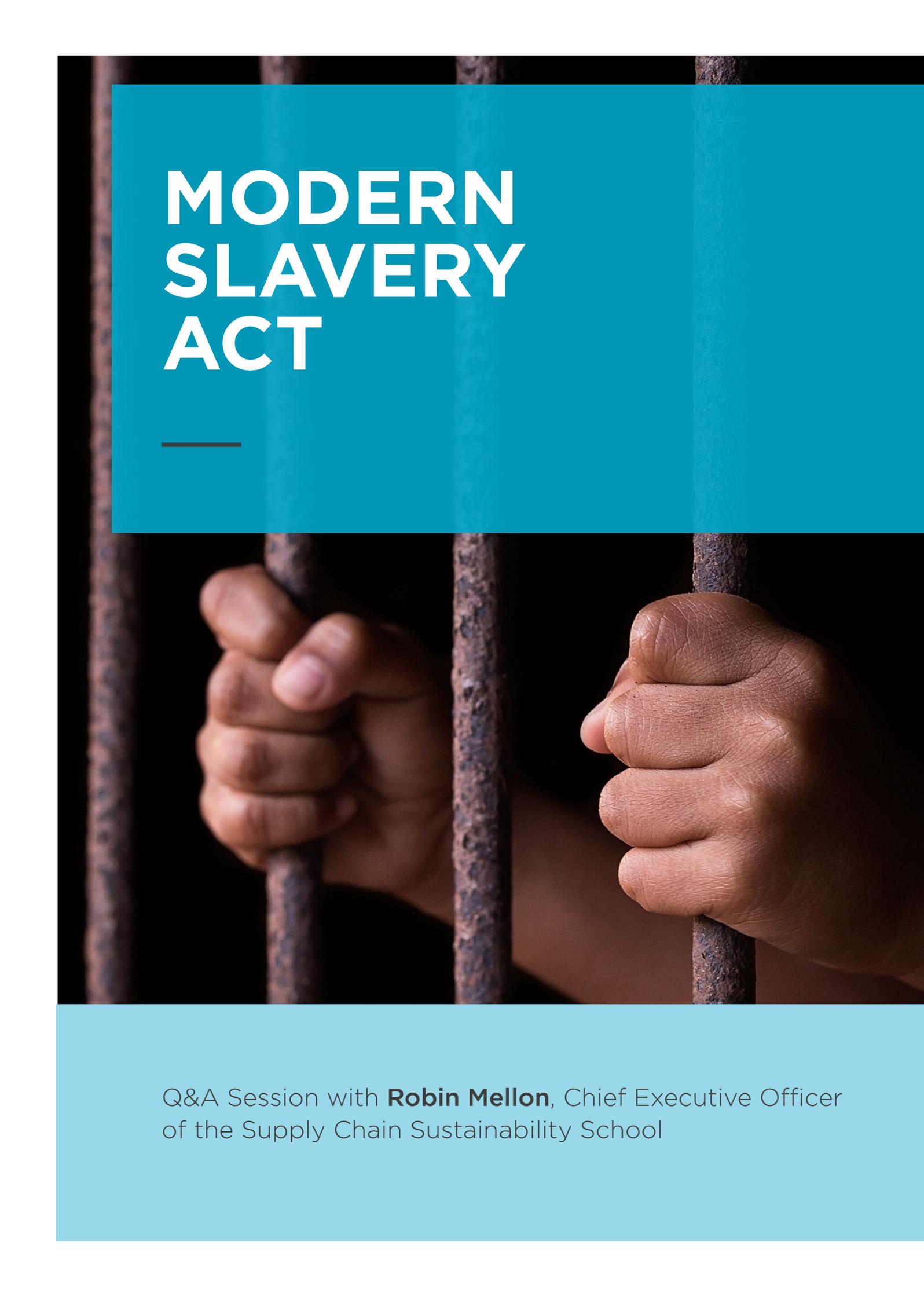
One day? From day one

Real change takes committed partners. From the earliest days of the ISCA Rating tool to today's Version 2, we have been there. Not 'waiting to see', but in the frontline making change happen, as board members, trainers, assessors, verifiers, to accredited professionals delivering the ratings themselves.

Arup believes it takes commitment to bring long-term change.
The future depends on it.

www.arup.com

ARUP



MODERN SLAVERY ACT

Q&A Session with **Robin Mellon**, Chief Executive Officer
of the Supply Chain Sustainability School

MODERN SLAVERY ACT Q&A SESSION

Robin Mellon, Chief Executive Officer of the Supply Chain Sustainability School, takes a few moments to talk with ISCA about Australia's forthcoming Modern Slavery Act and what the implications may be for infrastructure.

1. What exactly is Modern Slavery, and what's the difference between 'a bad job' and 'modern slavery'?

Well, 'Modern Slavery' is an umbrella term that covers different cases of human exploitation, where the victim can't leave or refuse, including human trafficking, servitude, child labour, sex trafficking, forced marriage, forced labour and debt bondage. One of the common situations when it comes to infrastructure supply chains is 'forced labour', which is defined by the International Labour Organisation as "all work or service that is exacted from any person under the menace of any penalty and for which the said person has not offered themselves voluntarily". The important words there are that "the said person has not offered themselves voluntarily." Many people around the world may feel that they are in bad jobs, or that they are paid badly; the difference with modern slavery is that those caught up cannot walk out, cannot look for another job, may not have chosen that situation or may be afraid to leave because of what might happen to them or their loved ones, and often because their pay, rights or documents have been withheld.

2. Can you tell us what the Modern Slavery Act is and when will it arrive in Australia?

The Modern Slavery Act is federal legislation requiring organisations with a turnover of more than \$100 million to make an annual public statement detailing what they are doing to look for and eradicate modern slavery within their operations and their supply chains. There is corresponding legislation being introduced at state level to focus on public and private sector organisations; for example in NSW covering organisations with a turnover of more than \$50 million and with any employees in the state. The UK introduced a Modern Slavery Act in 2015, and we are seeing similar legislation in other countries, requiring public statements from large organisations. The Australian Parliament introduced an Inquiry into establishing a Modern Slavery Act in Australia in February 2017, and there has been a comprehensive process of hearings, submissions, discussions and reports since then. The legislation introduced during 2018 means that organisations will need to be aware of their responsibilities and supply chains in order to start reporting – or in turn report to their clients – at the end of each of the coming financial years.

3. How has the UK industry reacted to the act and will the Australian one be similar?

The UK Modern Slavery Act represented a positive step in the battle against human rights abuses and modern slavery in extended supply chains. Although reporting has been slow to date there is evidence that the message is finding its way through industries, through organisations and through projects, with resources, educations and warnings available in different languages, for different workers and to tackle different situations. Put it this way; the term 'modern slavery' is now much more widely known around UK businesses, and it is likely that the UK Act will be ramped up over time. The Australian Modern Slavery Act will be similar but will include necessary differences about how organisations' public statements are made available, the turnover

of liable organisations, and how organisations will be helped to achieve compliance and improvements over time.

4. What are the implications for the infrastructure industry because the infrastructure is all built in Australia, isn't it?

We are naïve if we think that slavery only happens overseas, or that we are not implicated by slavery occurring elsewhere around the world. Whilst the prevalence of modern slavery may be low in Australia – estimated by the 2016 Global Slavery Index to be between 4,000-4,500 – many of our material and product supply chains go straight to the Asia Pacific region in which there are over 30 million people in conditions of modern slavery; over 66% of the global total. Think about the conditions under which people might be acting on job sites locally,

nationally and internationally, or in transport operations, in materials extraction or product manufacturing; could there be human rights abuses somewhere along the supply chain? If organisations are serious about knowing where materials and products have come from, and whether there are human rights abuses associated with the resources, production or transport, the infrastructure sector will need to increase their awareness of these issues and associated risks, assess the balance between costs and social impacts, set some medium to long term targets and embrace greater visibility and transparency in their supply chains.



5. Who will be affected by the act?

The Modern Slavery Act requires private sector entities based or operating in Australia, which have an annual global consolidated revenue of more than \$100 million, to report annually on the risks of modern slavery occurring in both their operations and supply chains. Other entities based, or operating, in Australia may report voluntarily. The NSW Modern Slavery Bill 2018 is intended to cover public and private sector organisations with an annual turnover of more than \$50 million, and outlines the role of an Anti Slavery Commissioner and the potential for substantial penalties. We're likely to see larger organisations requesting information from other organisations in their supply chains for information to help them make annual statements about their modern slavery risks and actions taken throughout the extended supply chain, as well as many smaller 'forward thinking' organisations making voluntary statements over time.

6. How will the Act help benefit the people affected by Modern Slavery in Australia and beyond?

The principle objective of the Act is not that every organisation has 'perfect' supply chains, but that our supply chains become increasingly visible and transparent. In the coming years, that means a business can make a clear choice between; Organisation A, that has made publicly available statements

about the modern slavery risks in their supply chain, what they're doing about it, and the due diligence they're undertaking; or Organisation B, that's doing nothing at all about modern slavery. It sends a clear message to the market that modern slavery will not be tolerated, and there will be a movement away from supply chains that may involve modern slavery. In addition, there will be a growing range of resources and support to help people affected by modern slavery, including assistance, mitigation and remediation for people who have experienced human trafficking, slavery or forced marriage in Australia.

7. How can the infrastructure industry prepare?

First and foremost, understand the issue of modern slavery so that you can help your staff, your clients and your suppliers understand their modern slavery risks and the actions that need to be taken. Secondly, consider what you know about your extended supply chains and where risks might lie; around processes, products, records, materials, countries or communication. Thirdly, work out who is covered by the Act; either directly, or as a part of larger supply chains or projects. And lastly, take advantage of the existing and emerging resources that can help you with this issue; the Supply Chain Sustainability School already has a wealth of free material available at www.supplychainschool.org.au/resources/modern-slavery.aspx

and over the next few years as you get to grips with different parts of your supply chain you can work out the best questions to ask (that will get authentic answers), the best resources to use, and the best suppliers to work with.

8. How can the infrastructure improve the sustainability of their supply chains?

Knowledge is key! 'Sustainability' as a topic has broadened rapidly over the past decade, and doesn't just include the energy, water and materials considerations of ten years ago, but also the economic factors around risk management, business case and resilience, but the rapidly emerging social issues around sustainable procurement, social value, diversity and inclusion, human rights and modern slavery and much more! The more you know about sustainability, and the more your clients, staff and suppliers know about sustainability in all its forms, the more likely you are to achieve your objectives – and that includes managing your risks, maximising your opportunities and having a truly sustainable business model. ISCA and the Supply Chain Sustainability School both play valuable roles in ensuring the success of more sustainable businesses AND more sustainable projects. 🌐

IS VERSION 2POINT-GO!



The benchmark for sustainability has shifted,
and the IS Rating Scheme is evolving.



By Nicole Boyd, ISCA Development Manager and architect of V2.0

ISCA has worked with industry to develop the next evolution of the IS rating scheme - IS Version 2.0.

This has been a collaborative effort developed by industry for industry. This would not have been possible without our financial partners who generously contributed funding to this important shift:



Along with the financial support, industry has more than pulled their weight in contributing hours of collective wisdom and expertise.



180
INDIVIDUALS



1397
HOURS



103
ORGANISATIONS



\$168
IN-KIND

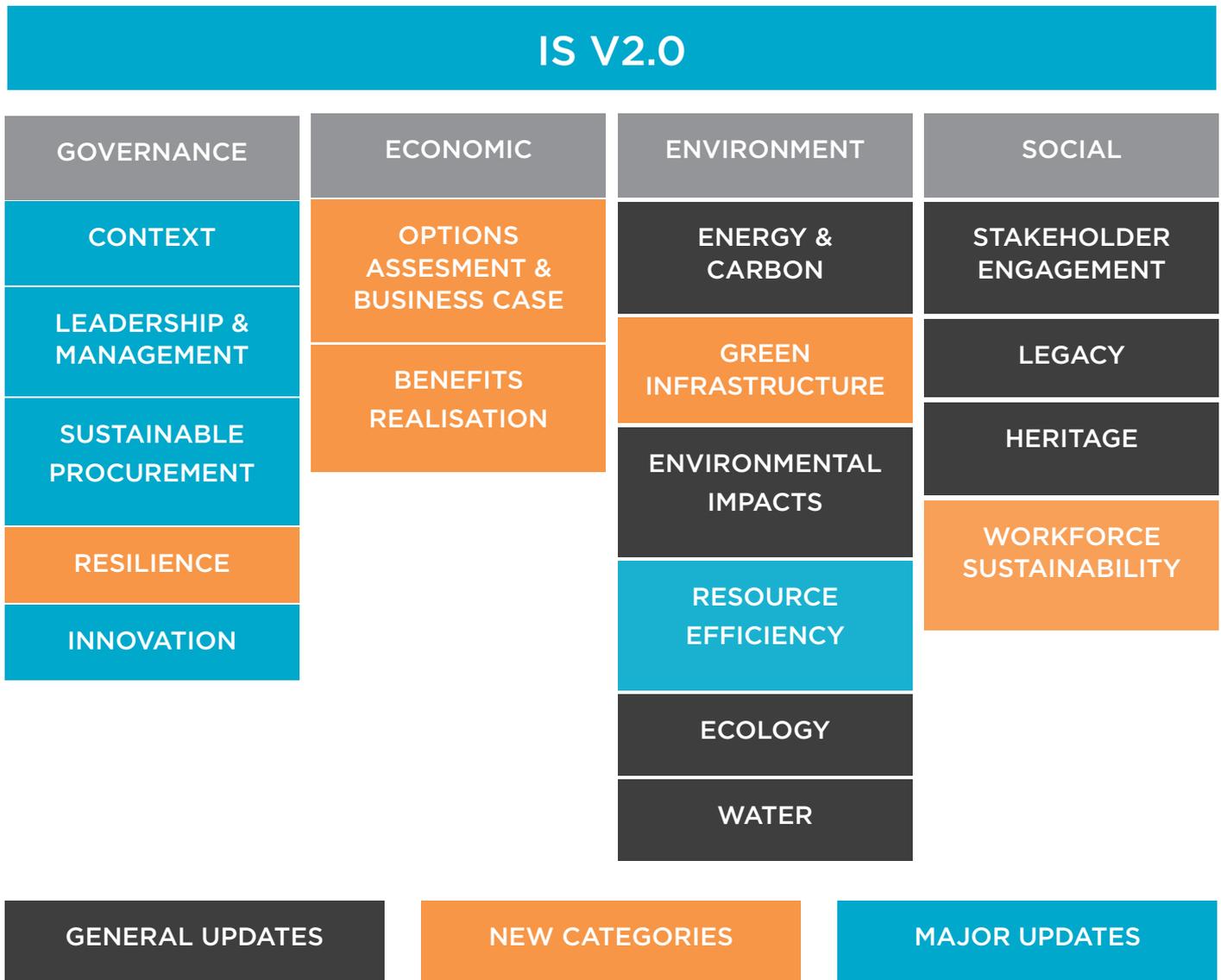
ISv2.0 has been developed in alignment with the UN's Sustainable Development Goals (SDGs), and strives to provide a comprehensive quadruple bottom line assessment. This will be achieved with the inclusion of important new social and economic elements.

“The new IS tool aims to challenge the infrastructure value chain to go even further in planning, designing, building and maintaining efficient and resilient assets. The tremendous investment from industry has ensured that the tool is flexible, accommodating of the complex nature of infrastructure, and importantly, remains a credible third-party verified approach to demonstrating value for money.”

ISCA CEO,
Ainsley Simpson



Major changes to the IS rating Scheme include the addition of an 'Economic' theme, which consists of 'Business Case and Options Assessment' and 'Benefits Realisation' categories. A 'Resilience' category has been added to the 'Governance' theme acknowledging infrastructure role in city and regional resilience. 'Green Infrastructure' is a new credit within the 'Environment' theme recognising living solutions to hard problems, and 'Workforce Sustainability' has been introduced to the 'Social' Theme:



ISv2.0, which is integrated across the asset life cycle, represents a more holistic approach to sustainability, and as such will be a step change for the industry. It will be challenging, but nothing great is ever easy.

Version 2.0 also introduces the Planning rating. This is a timely reminder that if you are going to give rise to enduring change, it must start at the earliest possible stages. This is when all the options are given due consideration; and it's

time to shift to decision making that addresses non-market values with the same rigour as the financial returns.

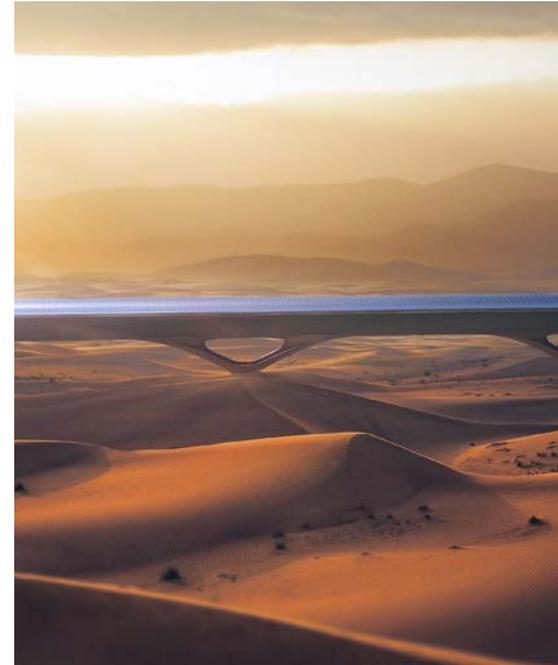
ISv2.0 will be launched through a series of ISCA events across Australia and New Zealand throughout June and July. 

HYPERLOOP:

MELBOURNE TO SYDNEY IN
FIFTY MINUTES USING THE SUN
AND MAGNETS



What if you could get from your office to downtown Sydney in under an hour, enjoy a dinner, and then arrive back home in Melbourne in time for the evening news?



Imagine the following scenario: It is the middle of the week and you have just finished a rather long day at the office in downtown Melbourne. On your way home, you begin thinking about that new restaurant in Sydney that you and a friend have been eager to try. What if you could get from your office to Sydney CBD in under an hour, enjoy a dinner, and then arrive back home in Melbourne in time for the evening news? Not only that, but what if you could make such a trip using nothing more than magnets and the power of the sun?

This is the promise of Hyperloop, a technology currently being delivered by Hyperloop Transportation Technologies. Launched in 2013, we created the company to develop the next generation of high-speed travel: the Hyperloop.

It was in August of 2013 when Elon Musk, along with a handful of SpaceX engineers, published what is known as the Hyperloop Alpha whitepaper. The white paper described a transportation system wherein capsules filled with people zoomed along in vacuum pressurized tubes at near the speed of sound. After it was published, Elon asked other entrepreneurs to take on the project as, at the time, he was too busy with Tesla, SpaceX and Solarcity. That's where we came in.

Around this same time, we were in the middle of launching a crowdsourcing platform called Jumpstartfund. The purpose of Jumpstartfund was to provide a platform for entrepreneurs to take on large projects leveraging the power of crowdsourcing. We reached out to SpaceX, received their blessing, and got to work. By November 2013, we had 100

engineers enthusiastically working on the project and had incorporated Hyperloop Transportation Technologies as the first Hyperloop company.

Today, HyperloopTT is comprised of over 800 members in 40 different countries including 50 companies. We have agreements in eight different nations and we are building the first full-scale passenger and cargo system at our research and development center in Toulouse, France. We are conducting feasibility studies in places like India and Ohio, and have completed them in Abu Dhabi and Slovakia. These studies have been conducted alongside government engineers and our partner, Atkins, one of the largest engineering construction firms. Together we have confirmed some of the most important beliefs about the Hyperloop system: that it is profitable.



There is not a train system in the world that operates at a profit. They all require some sort of government subsidy in order to operate. This is not the case with Hyperloop. Here's why. Hyperloop is simply the most efficient and sustainable form of transportation we have ever pursued.

So how does Hyperloop work? Since 2013, we have made some important discoveries and developments, including the fact that all of the technology is available on the market today and it has all been verified and tested by HyperloopTT and our partners. Imagine a capsule (similar to an airplane fuselage without wings), we put about 30 people in this capsule and place this inside of a tube. The air in the tube is moderated so that it takes very little energy to move the capsule. Utilizing electric motors, passive magnetic levitation, and energy harvested from solar panels and other sources like regenerative braking, HyperloopTT can now move passengers and cargo at speeds approaching the sound barrier. In fact, the system is so efficient that, depending on the route, it actually generates more energy than it uses allowing us to pump energy back into the grid. This is, in essence, how the Hyperloop works. Our engineers and scientists have been working the past 4 years to prove this, and these factors have all been independently declared feasible by organisations like NASA. Our

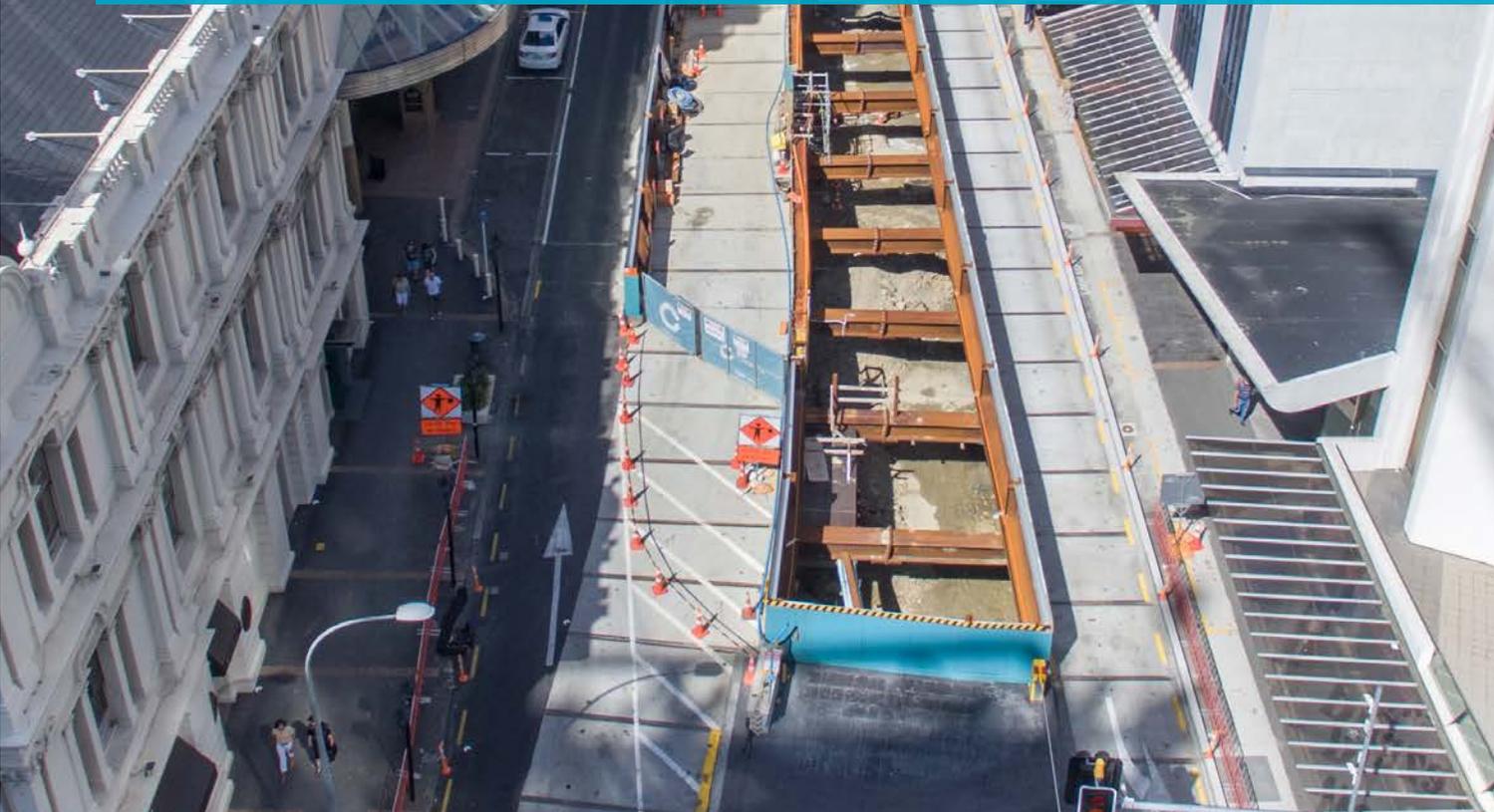
partners at Munich Re, one of the world's largest reinsurers, have published a risk report stating they will be able to insure our system.

And yet this is not enough for us. With HyperloopTT, we have created more than a company, we have created a movement that has its sights set on more than traveling from place to place at 760 MPH. We are setting out to solve bigger transportation issues. For example, if it takes you an hour to get to the Hyperloop station, we have not solved enough of the problem. This is why HyperloopTT recently launched our XO Square, an ecosystem devoted to innovation around solving issues around first and last mile, and logistics.

At HyperloopTT, we're imagining and building towards a world where transportation and getting around is viewed much more like the way most of us notice technology, that is most of us really only notice it when it is not working. Right now we notice transportation every day. What if we didn't? What if transportation was so seamless that the daily hurdles of sitting in traffic or waiting in security lines were gone completely? We have proven it is possible to build high-speed transportation systems in a sustainable and profitable way, now we can focus on solving the bigger problems. 

INNOVATION

CREATIVE CONSTRUCTION



"Creativity is intelligence having fun"
- Albert Einstein.



By Ben Lippett, Environment and Sustainability Operations Manager

The construction industry is often faced with implementing solutions for complex infrastructure in constrained environments. But what drives innovation? How do we overcome the 'business as usual' solution driven engineering that is often faced by major project design and construction?

As a major construction organisation, McConnell Dowell is committed to innovative and customised solutions, providing infrastructure solutions that are functional. Innovative engineering has always been part of McConnell Dowell's mantra, through ingenuity and persistence we have long strived for 'Creative Construction.'

The increasing intricacy of the construction industry, changing market demands and growing societal awareness, ensure innovation is at the forefront of successful projects. McConnell Dowell is well versed in these challenges, with recent projects having complexities that present their own challenges and priorities while also promoting innovative outcomes.

Webb Dock Maritime Package (Victoria)

- The design solution for the continuous 920m Webb Dock West (WDW) wharf structure was a combi-wall. This involved installing vertical tubular and sheet piles, which in turn allowed for the retention of insitu material behind the combi-wall, which would otherwise require dredging.
- Sheet pile cut-off on Webb Dock East allowed for material under the wharf to remain insitu. This reduced the requirement to dredge and dispose of this material.
- During the planning stage of the WDW crane pad it was identified an alternative material, Envirocrete (made from recycled products) could be used for the construction.
- Planning for safety, using robotic hydro demolition technologies and implementing purpose built platforms for working over water.
- Undertaking sulphate reducing bacteria analysis of groundwater to optimise pile steel thickness for the intended design life.
- Allocation of project margin against stakeholder management performance.

O'Bahn City Access Project (South Australia)

- Staging of works and a contamination soil re-use strategy resulted in excavated material being re-used as tunnel backfill, that resulted in cost savings, reduced environmental footprint and a reduced number of trucks on the local road network.
- The tunnel roof consisted of pre-stressed concrete planks, post-tensioned into sets of three. The original plan was to install individually, however the team identified that these could be developed off-site where post-tensioning of the triples could occur and be delivered to site, minimising impacts to the local road network (including road closures).
- A 'no surprise' approach to stakeholder management resulting in minimal community complaint and minimised traffic disruption within a highly constrained road network.

Kororoit Creek Road/ Abbotts Road Level Crossing Removal – ISCA Registered (Victoria)

- Installation of rail signalling conduits in an above ground 'MULTIduct' system. This reduced groundworks in high risk areas for underground services.
- Through global research and collaboration across the industry, MCD have led the implementation of the u-trough rail bridge superstructure across the LXR Project. A first in Australia, this solution provides an economical structural arrangement that minimises visual impact and simplifies construction.
- Working to incorporate recycled materials into the rail specifications through the use of recycled glass sand as screening material during the backfill of services This provided 100% recycled product in lieu of traditional construction materials.

- Various innovation collaborations including a Drone Survey trial currently in progress with Telstra and CSIRO's Data61 utilising SLAM technology with Lidar for site feature survey.
- Implementing a carbon neutral, solar powered portable traffic light integrated with pedestrian crossing function. The traffic light/ pedestrian crossing was used as a temporary safety measure to mitigate crossing risks for employees across a busy dual carriageway road.
- Woody Meadows – native grasses in scoria rock being a 'first for rail' – zero maintenance landscaping.
- Early regulatory and stakeholder engagement allowed the alliance to utilise the precautionary principle and successfully receive approval for the reuse of contaminants onsite (collaboration with regulator led both industry and new governance). Through early planning and onsite containment, the project is striving for 100% of soil and groundwater reuse onsite. This outcome reduces greenhouse gas emissions via transport and disposal, reduced heavy vehicle movements onsite and less impacts to local traffic.

City Rail Link Contract 2 – ISCA Registered (New Zealand)

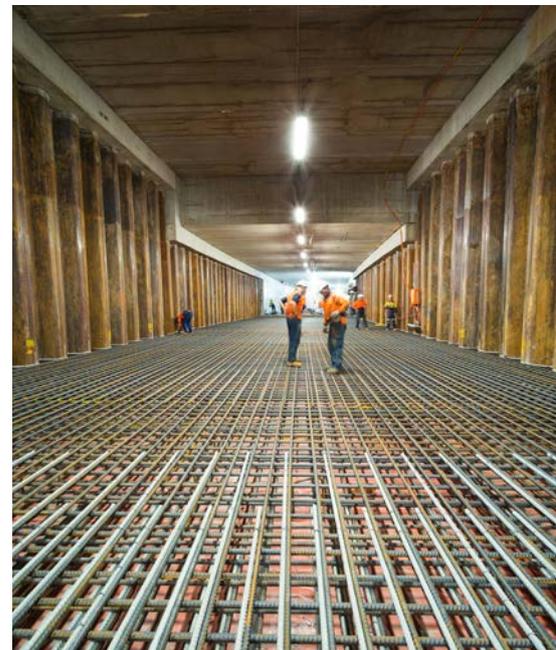
- Obtaining power from NZ national grid (85% renewable) rather than business-as-usual use of onsite generators. The benefits of this connection reduced running costs, avoided time and expense of applying for regulatory approval and resulted in no air quality impact or noise impact.

Use of a Cased Continuous Flight Auger piling system eliminated settlement risk for adjacent (heritage) buildings. This piling procedure also dimensionally accurate which reduced concrete quantities and waste byproducts.

The examples above highlights how McConnell Dowell have had a consistent, holistic approach over recent years to the delivery of infrastructure. McConnell Dowell's approach has been enhanced from knowledge gained from Gold Coast Light Rail (GCLR) and our involvement with it as an ISCA rated project. The biggest transition for McConnell Dowell since GCLR has been a focus on the promotion internally of micro scale construction innovations across multidisciplinary projects.

and ensure opportunities are realised, challenging business as usual;

- Seeking alternative technologies and processes to minimise our social and environmental impact;
- Implementing a sustainable procurement process; and
- Knowledge sharing of economic, environmental and social innovations within the wider business across multidisciplinary projects.



We have always strived for thinking outside the box, however, with ISCA rated projects providing the goal to achieving 'Innovation Points' has further challenged our organisation on a micro scale to do things differently. Like in sport, the notion that the one percentage aspects that are not usually identified in statistics or functions (and often considered minor improvements), do, in fact contribute significantly to the success of our projects.

Since first applying the principles of Innovation points on the GCLR project, we have grown and adapted our thinking to further challenge the norm, we are;

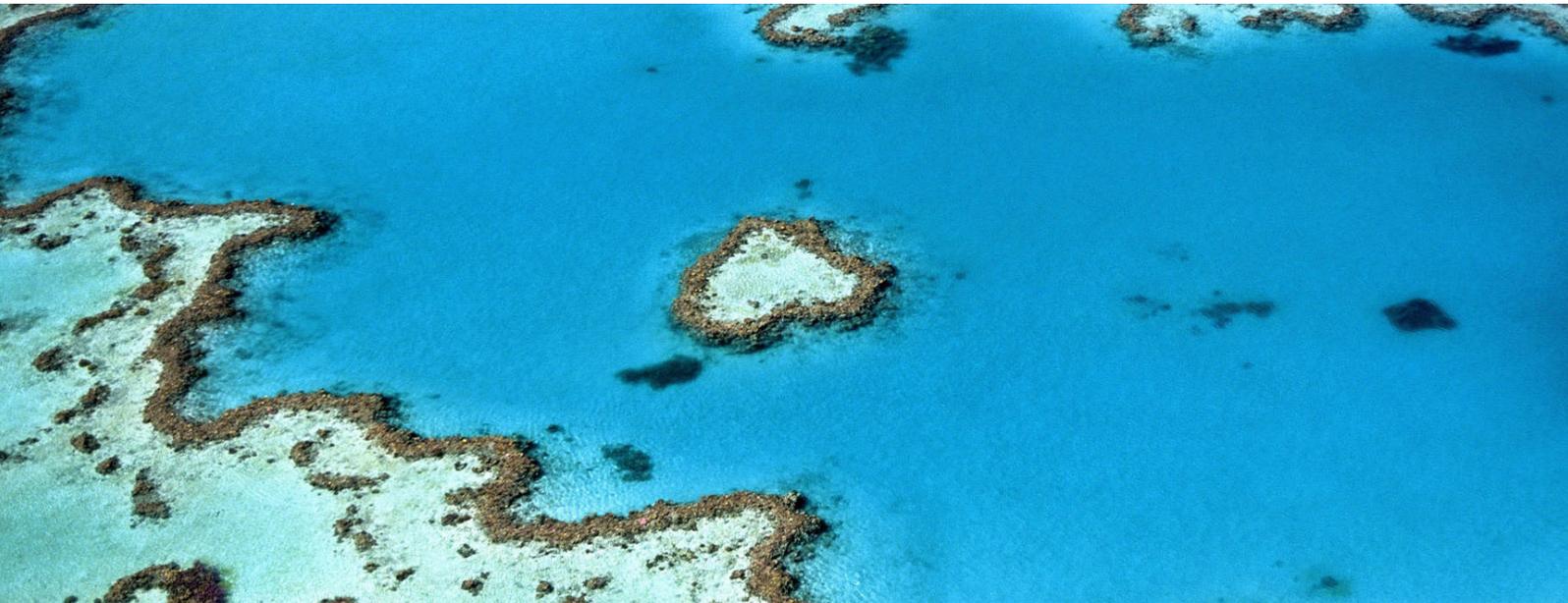
- Undertaking earlier engagement with clients and stakeholders to review design standards

Historically McConnell Dowell have promoted macro level solutions. Now, through the initial goal of achieving innovation points, we are driving micro level excellence on all projects and promoting these within our broader business. What we have achieved and continue to develop, allows for knowledge sharing and a broader application of excellence in the Group's project practices.

McConnell Dowell have moved from the engineering solution driven approach of project delivery to one that encourages and promotes sustainable construction. Innovation is at the core of the organisation's values, driving our efforts in providing 'whole of life' project outcomes across all micro and macro levels. 🌐



COLLABORATING FOR THE BEST OUTCOMES



The Queensland Government Department of Environment and Science (DES) and the Infrastructure Sustainability Council of Australia (ISCA) have collaborated to investigate how the Infrastructure Sustainability (IS) rating scheme could be used to embed best practice in Queensland climate change policy and planning instruments as well as ensuring smart investment in state infrastructure.

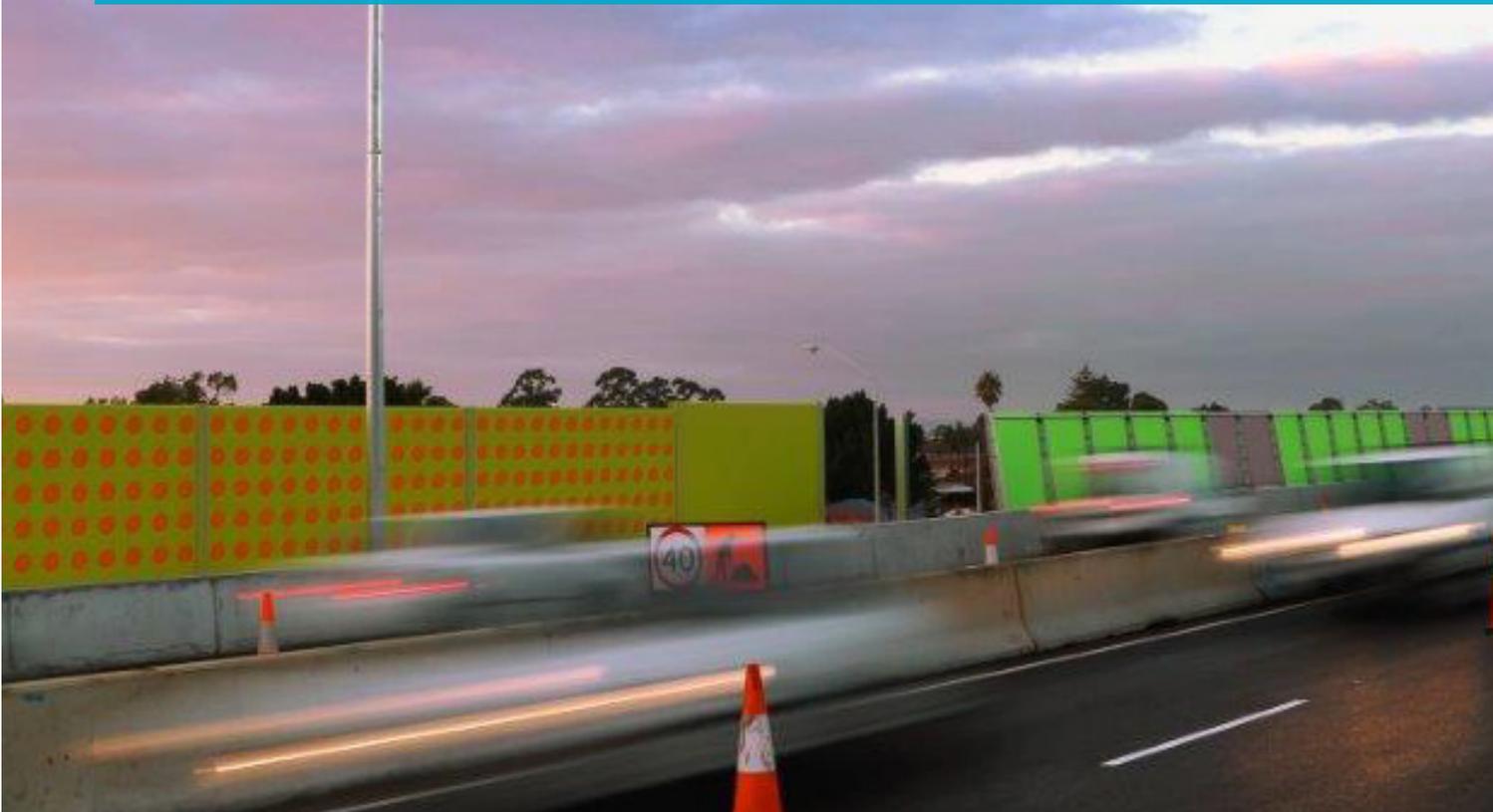
In Queensland there is currently over \$20 billion dollars' worth of infrastructure that is either registered for or has completed an IS rating.

The Queensland Government has also invested in the development of Version 2.0 of the IS rating scheme, which will be released on the 1st of August this year. Additionally, the Queensland Government Department of Transport and Main Roads has mandated that all projects over \$100 million must undertake an IS rating. This is in line with the Queensland Government's State Infrastructure Plan requirement that all infrastructure projects over \$100 million must undertake a sustainability assessment.

This collaborative piece of work investigates how the sustainability credits within the IS rating scheme could be used innovatively to inform policy development, that will influence the sustainability of infrastructure in Queensland. 

HOW SUSTAINABILITY CAN BE DELIVERED.

A CASE STUDY



Main Roads Western Australia's Northlink WA Southern Section (NLWA-SS) was awarded the 2017 IS Outstanding Achievement Award.

By Scott Frazer, Group Manager – Environment, Sustainability & Business Resilience, John Holland

Late last year, Main Roads Western Australia's Northlink WA Southern Section (NLWA-SS) was awarded the ISCA IS Outstanding Achievement Award which recognised the IS certified project that demonstrated the highest overall score and sustainability achievements. Here's a look at what the project did to achieve this sustainability honour.

The NLWA-SS Project achieved an IS Design Rating of 'leading' with a score of 93 points (the highest ever for a design and construct contract), and eleven independently verified sustainability innovations and enhanced economic, social, and environmental outcomes. Accordingly, it may go some way towards explaining how infrastructure sustainability can be delivered and provides an important case study for the industry.

will be transformed through the creation of job opportunities, making the morning commute easier and getting people home quicker.

From start to finish, sustainable outcomes were embedded in the way that NLWA-SS was conceived, designed and built – winning it the Infrastructure Sustainability Council of Australia's outstanding achievement and impact awards in 2017.



Northlink WA – Southern Section is more than a road – once the adjacent Central and Northern sections are completed, the communities of Morley and Muchea will be connected by a non-stop transport route for the first time, meaning people spend less time in traffic, and more time on what matters. As a result, lives

Main Roads WA Senior Project Director, Rob Arnott, explains that sustainability was at the core of the project as conceived by Main Roads WA, flowing through the concept design produced by the BG&E-led development team, and into the detailed design and construction by John Holland.



“The excellent sustainability outcomes achieved on NLWA-SS were only made possible through the shared commitment of Main Roads WA, BG&E, John Holland, and others - it was an exemplary team effort”.

“The biggest and most important opportunities were acknowledged, and the elephants in the room called out, by using techniques such as lifecycle assessment. Alongside capital costs, a genuine and sustained effort was made to consider social value, environmental value and lifecycle costs. And a mechanism was implemented that enabled the realisation of opportunities that were outside the specification, representing a new level of maturity for client/contractor relationships.”

Pavement with a 10 per cent reclaimed asphalt content was utilised project-wide, and a significant reduction in water use during operations as achieved by redesigning landscaping to avoid the need for reticulated watering.

A shared path for cyclists and pedestrians was identified early on as a priority for the community and was subsequently incorporated into the design. The project also achieved a 15 per cent reduction in energy use on the path by using light dimming through the quietest times of night.

What other projects can learn about sustainability.

Mr. Arnott said the lessons from NLWA-SS showed how major infrastructure projects can embed sustainability throughout delivery to ensure better outcomes for local communities. “The project continues to have broad community support and locals are seeing firsthand how connectivity and liveability is improving,” Mr. Arnott said. “Long-term enhancements to water quality, flood risk, ecological value, top soil, landscape character, local heritage values, and community wellbeing have been achieved via the project’s high quality urban design, public art, drainage, landscaping and shared path solutions.

The enhanced durability and operability of the project’s pavement, structures and lighting solutions have reduced construction impacts and will enable ongoing savings over the full life of the project. The willingness of Main Roads WA, the development team led by BG&E, and John Holland to pursue innovation and trial new approaches has led to market changing technologies such as intelligent lighting systems, EME (lean) asphalt and on-site solar systems being one step closer to wholesale uptake by industry.

In particular, the close partnership forged between the project parties allowed the team to raise the bar when it came to embedding the elements of sustainability within during the detailed design and construction phases – there was ongoing engagement on economic, social and environmental impacts and value, and a firm commitment to sharing information openly. Also key was the culture of sustainability that existed within the John Holland delivery team.

John Holland’s NLWA-SS Project Manager, Ben Johnston, agreed stating that “Projects like NLWA-SS are examples of how sustainable social, environmental and economic outcomes can be achieved through the creation of people-centred solutions to complex challenges, and is a living example of our commitment to the values of caring and empowering, and being imaginative and future focused. It’s our belief that the same creativity, innovation and excitement that was generated on NLWA-SS can flourish on more projects – leaving a legacy that carries on long after this project is finished, and transforming lives.”

The NLWA-SS project parties hope to see the same principles that led to their success implemented on major projects around Australia and with this in mind, Main Roads WA and John Holland have commissioned the publication of an industry paper on the project’s sustainability learnings. 

Australian firsts

- **The use of lifecycle assessment by a contractor in decision making during detailed design**
- **Implementation of a tightened asphalt specification to improve water resistance and durability to increase pavement design life**
- **High modulus asphalt (EME2) trial on 700m section of the highway**

Western Australia state firsts

- **Grade-separated roundabout demonstrated to be the preferred solution with regard to congestion and road safety**
- **Adaptive lighting trial**
- **Dimming of Principal Shared Path lighting for 50 per cent of each night**
- **EME2 asphalt trial**
- **Design of pedestrian underpass using 3-pin arch structure**
- **Supplier Sustainability Day in collaboration with Supply Chain Sustainability School**
- **Principal Shared Path width increased to four metres for length of NorthLink WA**
- **Solar powered variable message sign (VMS) trial**

SCOTT POINT SUSTAINABLE SPORTS PARK

In the next few years 20,000 new residents are expected to call Scott Point and neighbouring Hobsonville home.

At the heart of the new development will be the Scott Point Sustainable Sports Park, an Auckland Council initiative to build New Zealand's first fully sustainable sports park.

As a community facility, the park will be governed by the Upper Harbour Local Board, who is proud to support the development and the benefits it will offer.

The Place

Scott Point Sustainable Sports Park (SPSSP) occupies part of the Scott Point peninsula in the upper reaches of the Waitemata Harbour, northwest Auckland. The Scott Point area is transforming from a peri-urban landscape to a new urban settlement. Together with the adjacent Hobsonville Point it is expected the park will serve upwards of 20,000 residents in the near future.

The significance of Scott Point is deeply held in the historic, traditional, cultural and spiritual relationships of mana whenua (Maori authorities) to the area.

The land has most recently been used for horticultural and grazing activities. Many of the landscape features relating to this use are still present but will be removed to make way for the park. Opportunities exist to retain and re-purpose some elements to provide a trace of past activity, contributing to an enhanced sense of place and sustainable use of resources.



Site Location Plan

Vision

To create a cutting edge sustainable park at Scott Point that the community are proud of.

“The sports park truly embodies the realisation of Auckland Council’s vision of an Auckland that celebrates our diversity and cultural richness, enhances and cares for our outstanding environment, and leverages our innovative nature.”

Lisa Whyte, Upper Harbour Local Board Chair
The Project

Scott Point Sustainable Sports Park is a 16.4ha area of land in the northwest of Auckland that is about to be transformed from a rural landscape to a public park to meet the needs of a new community.

[Auckland Council](#) engaged [WSP Opus](#) (formerly Opus International Consultants) to create a detailed master plan, working with senior council team members to deliver on the vision. The project began late 2016, with next stage detailed design to be undertaken in 2018, and construction expected to commence in early 2019.

Development of this park is no ordinary feat. Scott Point is set to become the first fully sustainable park in New Zealand. Auckland Council is embarking on this project as a flagship for the future sustainable provision of parks. It will help steer the future course of design, development, management and governance of parks across Auckland in a way that responds to the urgent needs of our planet for sustainable custodianship.

Auckland Council’s Service Principles have informed the development of the master plan. These include: Resource sustainability; Community equity and belonging; Re-wilding; Team and co-design; and Standards and outcomes.

The park will comprise three main areas: an area for sports and active recreation, an informal recreation area, and an area of ecological restoration and conservation. Each is defined by the geography of the site. Natural landforms are retained and earthworks minimised.

The process of imagining and projecting a flagship sustainable park has involved extensive engagement with mana whenua, key stakeholders and specialists.



Key principles underpinning the SPSSP master plan

Design led

A design-led approach has been employed to guide the project toward robust and integrated outcomes. A design-led ideology ensures that all decisions are motivated by design considerations – whether functional or aesthetic, and places people at the heart of decision-making. With such an approach to master planning, the park will ensure it contributes to a rich and vibrant sense of place and continues to build a legacy for the Scott Point community.

Iwi engagement

Collaboration with Ngā Maunga Whakahii o Kaipara and Te Kawerau Iwi Tribal Authority has been integral in the concept development to ensure that Māori values and principles are embedded. Involving the community and other key stakeholders has ensured the needs, desires and aspirations of those who will grow to use and love this place are considered in the design outcomes.

Stakeholder engagement

Community engagement has enabled the needs and aspirations of the future users of the park to be taken into account in the design of the park.

Elected members and officers of the council have provided the policy framework and scope definition to ensure the park meets the needs of a new community while fulfilling the key objectives of sustainability.

Investigations

Comprehensive site investigations have been undertaken by experts in order to understand the existing conditions and opportunities for sustainable development.

Infrastructure Sustainability Rating

Auckland Council is using the [Infrastructure Sustainability Council of Australia Infrastructure Sustainability rating tool](#) (IS Rating Scheme) to incorporate sustainability across the design and construction of the park. This is the first time the tool has been used in New Zealand for a park project. ISCA considers performance across six themes: People and Place, Using Resources, Emissions Pollution & Waste, Ecology, Innovation, and Management & Governance.



ISCA:IS Rating Tool Themes

The Master Plan

The master plan is the first major milestone in the process of delivering SPSSP.

Objectives:

- Describe the vision for a sustainable sports park at Scott Point
- Identify the process in developing the design of the park
- Show how the design is responsive to lwi requirements and community wishes and aspirations
- Build an understanding of the potential of the park and its ability to catalyse benefits beyond the site itself
- Establish a blueprint to be taken through the next phases of the project.



SPSSP Master Plan

The heart of the park features a landmark energy generating sculpture as an icon for SPSSP

Sustainability Features

Scott Point Sustainable Sports Park will embrace sustainable technologies to promote renewable energy, minimise waste, reduce reliance on potable water, minimise carbon emissions and optimise carbon sequestration. The park represents a pilot project for Council to rollout across Auckland city and will set a precedent in the development and design of park space in New Zealand. The Council's aim is to achieve the highest IS rating with a 'leading' level of accreditation (awarded at the completion of the project).

Renewable energy such as solar panels, wind turbines and kinetic energy is harvested and used on the site providing a 'closed energy loop'. Provision for sustainable transportation to, from and around the site, like public transport, electric vehicles and e-bikes, has been included.

Sports fields require a lot of water. As such, best practices and innovative products for stormwater capture, treatment and reuse will minimise maintenance and use of potable water for irrigation.

WORDS

Mark Bowater, Head of Parks Services, Auckland Council (Project Client Lead)
Catherine Hamilton, Principal Landscape Architect, WSP Opus (Project Director)
Kris Bird, Manager Sports Parks Design and Programme, Auckland Council (Project Investigation and Design)

THE CAULFIELD TO DANDENONG LEVEL CROSSING REMOVAL PROJECT



Lendlease along with its Alliance partners - Level Crossing Removal Authority (LXRA), CPB Contractors, WSP, Aurecon, and Metro Trains Melbourne - is delivering the Caulfield to Dandenong level crossing removal project (CTD) along one of Melbourne's busiest rail corridors.

The project involves rebuilding five stations and removing nine level crossings to create renewed village centres at Carnegie, Murrumbena, Hughesdale, Clayton and Noble Park. Ultimately, the elevated rail design will convert the previous brown-field rail corridor into 22.5 hectares of new green-field linear park beneath the structure leaving a positive legacy for the community.

This innovative world class design infrastructure project required a state-of-the-art precast concrete yard to produce the 2,200 pre-cast

efficiency, high-emissions output and little whole-of-life considerations, creating negative impacts on our environment. The challenge for CTD was to identify and embed sustainability applications and solutions into the precasting processes to ensure urban, visual and environmental impact.

CTD demonstrated the incorporation of multiple whole of life sustainability initiatives into key phases of the precast yard including design, construction and materials processes of the facility and in the precast materials. This



Diesel powered gantry crane in action lifting a 26-tonne concrete segment.

segments required to build parts of the new elevated rail line. This purpose-built precast yard was essential in meeting the precise architecturally finished viaduct design and also the high production rates for the concrete segments. Each precast segment weigh 26 tonne and at peak production, the precast yard facility produced up to 17 segments per day.

CTD recognised business-as-usual pre-cast concrete facilities typically had low energy

also extended to the materials makeup of the concrete, aggregates and steel within each precast element.

These initiatives have resulted in real and material reduction to the impact on the environment, including reductions in greenhouse gas emissions, and diverting waste from landfill by using recycled content in the construction and manufacturing processes.



Key sustainability initiatives include:

- More than 17,000 tonnes of recycled concrete was used in the construction of the precast facility foundation negating the need for excessive fill importation.
- Reducing the embodied energy of the precast segment by specifying a concrete mix that included a 21% cement replacement product through the use of fly-ash.
- Utilising the facility's 13,000 m² roof catchment area to capture rainwater within three x 20,000 litre tanks which has enabled the reuse of approximately 10,000,000 litres for water at the facility.
- With 24/7 precasting activities, LED lighting was installed throughout the facility to reduce the lighting energy demand by over 60%. In addition, daylight sensors were installed to ensure lights

weren't unnecessarily used when there was sufficient daylight outside. Skylights were also installed throughout the building to reduce lighting requirements on sunny days.

- The generators that ran the 50 tonne gantry hoists at Pakenham and the two 240 tonne gantry cranes at Murrumbena used 20% biodiesel – a renewable energy source. The generator technology adopted allowed for the optimisation of power output by reducing engine capacity when less load was required. Over the life of precasting activities, this allowed the saving of approximately 33,000L of diesel and contributed to the reduction of 90 tCO₂e.
- Producing the precast segments locally reduced transport costs and associated greenhouse gas emissions.
- Through this facility, approximately 170 workers from a variety of trades

including steel fixers, welders, concreters, crane operators and precast concrete labourers have had role-specific training. Other programs beyond role specific training were also implemented in areas of health and safety, first aid, leadership, manual handling, working at heights and operation of gantry cranes.

Lendlease along with its Alliance partners are committed to delivering high quality assets safely and with a genuine commitment to advancing sustainability within the industry.



LIBERTY STEEL:

DELIVERING ON ITS
SUSTAINABILITY PROMISE



Liberty Steel and ISCA are united in the pursuit of sustainable outcomes for Australia's infrastructure.



LIBERTY STEEL: DELIVERING ON ITS SUSTAINABILITY PROMISE



LXRA Carnegie Station, Vic.

Liberty Steel is proud to partner with the Infrastructure Sustainability Council of Australia to facilitate infrastructure that can deliver optimum social and environmental outcomes.

The company is Australia's largest manufacturer and supplier of structural and reinforcing steel, including hot rolled structurals, pipe and tube, rod, reinforcing bar, wire products and rail. Liberty Steel's structural and reinforcing steel and rail products enable the construction of steel-framed buildings, buildings framed in concrete and nation-building infrastructure projects.

The company is a key supplier and partner to the construction industry. Approximately 80 per cent of the steel Liberty Steel manufactures is used by the construction industry, which places the company on the front line in the delivery of

resilient infrastructure that meets recognised sustainability targets. 'Sustainability' is one of Liberty Steel's core values and aligns with ISCA's core value of 'Improving the productivity and liveability of industry and communities through sustainability in infrastructure'.

The important role played by Liberty Steel in delivering better outcomes for communities and the natural environment is recognised by ISCA, with Acting CEO Ainsley Simpson stating: "Liberty Steel actively find ways to play their part as integral partners in infrastructure through the provision of sustainable steel products – this is enabling the delivery of better outcomes for Australian communities."



Taking the lead in sustainability

Liberty Steel takes a proactive approach to sustainability by striving for continuous improvements in environmental performance and by taking its social responsibilities seriously.

In Australia and around the world, GFG Alliance, owner of Liberty Steel, supports local communities by investing in local industry. The company's mission here in Australia is to transform metals manufacturing, engineering and mining by building on local resources, sustainable energy, new technology and enhanced skills.

Liberty Steel's efforts are informed by its GREENSTEEL strategy, which focuses on increasing the use of renewable energy, promoting greater use of recycled materials and operating facilities close to key markets. The results of that strategy can already be seen with Liberty Steel increasing the proportion of energy from renewable sources it uses in its manufacturing mix, and by investing significantly in renewable energy assets through its sister company SIMEC ZEN Energy.

In May of this year, SIMEC ZEN Energy signed a 15-year power purchase agreement to take most of the output from French renewable energy

company NEOEN's Numurkah Solar Farm in northwest Victoria. The landmark deal will supply sufficient renewable energy to operate the Liberty Steel Laverton steelworks in Victoria.

Liberty Steel also makes it easy for its industry partners to understand the sustainability impact of using steel in construction projects by supplying Environmental Product Declarations (EPDs) with its range of hot rolled structural, rail, merchant bar and reinforcing products.

Liberty Steel's EPDs provide transparent information about the environmental impacts of the company's steel products throughout their life cycle. Liberty Steel's construction partners can boost their projects' sustainability ratings by procuring Liberty Steel's products and services, and leveraging these EPDs.

One of the projects currently maximising the benefits of Liberty Steel's EPDs is Victoria's \$1.6 billion Caulfield to Dandenong (CTD) Level Crossing Removal project. Liberty Steel has supplied 4000 tonnes of prefabricated reinforcing steel to the project, which is elevating sections of rail line and removing nine dangerous and congested level crossings. The use of Liberty Steel's Australian-made reinforcing steel is helping the CTD project accrue points in the materials category of the IS rating tool, with the project targeting an 'Excellent' sustainability rating.





Collaboration with ISCA

Liberty Steel's Rob Johnson says the ISCA framework is central to the drive for more sustainable outcomes for steel.

The ISCA framework provides a platform for early engagement and collaboration at all levels of the supply chain which, in turn, provides opportunities to develop and deliver more sustainable outcomes for projects and for steel.

He says Liberty Steel is pleased to act as an Australian and New Zealand official partner for ISv2.0 launch events.

"ISv2.0 represents a great step forward in respect to sustainability ratings for infrastructure, incorporating a more holistic approach to sustainability via the inclusion of key elements such as economic and social

sustainability, as well as a focus on sustainable procurement," Rob says.

"ISv2.0 encourages and promotes greater collaboration and communication across all supply chain partners for infrastructure projects. Collaboration, early engagement and communication are fundamental to successfully driving improved sustainability outcomes."

He says Liberty Steel will continue in its collaboration and communication efforts as it seeks to invest in renewable energy, support local communities, and embed and enhance the company's core values of Family, Sustainability and Change.

"Our intention is to operate our business for the long term and build a legacy for the future," he says.

"The ISCA framework provides a platform for early engagement and collaboration at all levels of the supply chain which, in turn, provides opportunities to develop and deliver more sustainable outcomes for projects and for steel." ○

THE ROAD TO SUSTAINABLE INFRASTRUCTURE

EPDs: Liberty OneSteel's sustainability credentials.

Liberty OneSteel's Environmental Product Declarations make it possible for projects to gain additional points when using national building rating tools.



"At ISCA, our aim is to drive more sustainable outcomes through infrastructure. This means enhancing the productivity of our industry and delivering better outcomes for communities and the natural environment. These kinds of successes are only made possible through collaboration, innovation and commitment across the supply chain. Liberty OneSteel actively finds ways to play their part as intergral partners in infrastructure through the provision of sustainable steel products - this is enabling the delivery of better outcomes for Australian communities."

Ainsley Simpson,
CEO, Infrastructure Sustainability Council of Australia



ISQA