

2021 IMPACT REPORT

Pathways to Impact

Infrastructure Sustainability Council

ANZ

Acknowledgements

We thank all our partners who have contributed to this report; in particular, our report sponsor ANZ.

Our social licence to operate relies on the trust we earn with the organisations and people we work alongside every day, including ISC members, suppliers, partners, policy makers, regulators, industry bodies, communities, tangata whenua and the Traditional Custodians of the lands we are privileged to work on.

ACKNOWLEDGEMENT OF COUNTRY

We acknowledge the Traditional Custodians of the lands on which we carry out our work, acknowledge their deep connection to land, water and culture, and pay our respects to their elders past, present and emerging.

RESPECT FOR TE AO MĀORI

We respect the tangata whenua of Aotearoa and are committed to upholding the principles of Te Tiriti o Waitangi and to safeguarding te reo and other taonga.

A message from our report sponsor

ANZ's Expertise in Sustainable Finance

ANZ is a leading sustainable financing bank in Asia Pacific, assisting customers to shift to a Net Zero carbon economy. We operate in 33 countries globally, including 29 in the region.

ANZ's Purpose is to shape a world where people and communities thrive. This Purpose underpins all we do with our customers, employees, shareholders, the communities in which we operate and other stakeholders.

ANZ is committed to funding and facilitating at least A$50 billion in sustainability solutions by October 2025.

The bank is actively working to encourage and support 100 of its highest-emitting business customers to identify their climate change risks, create transition plans and report publicly on their progress.

At ANZ, we are dedicated to ensuring that environmental sustainability is at the centre of our strategies, planning and decisions.

Contact the ANZ Sustainable Finance team or your ANZ Relationship Manager for more information.

sustainablefinance@anz.com

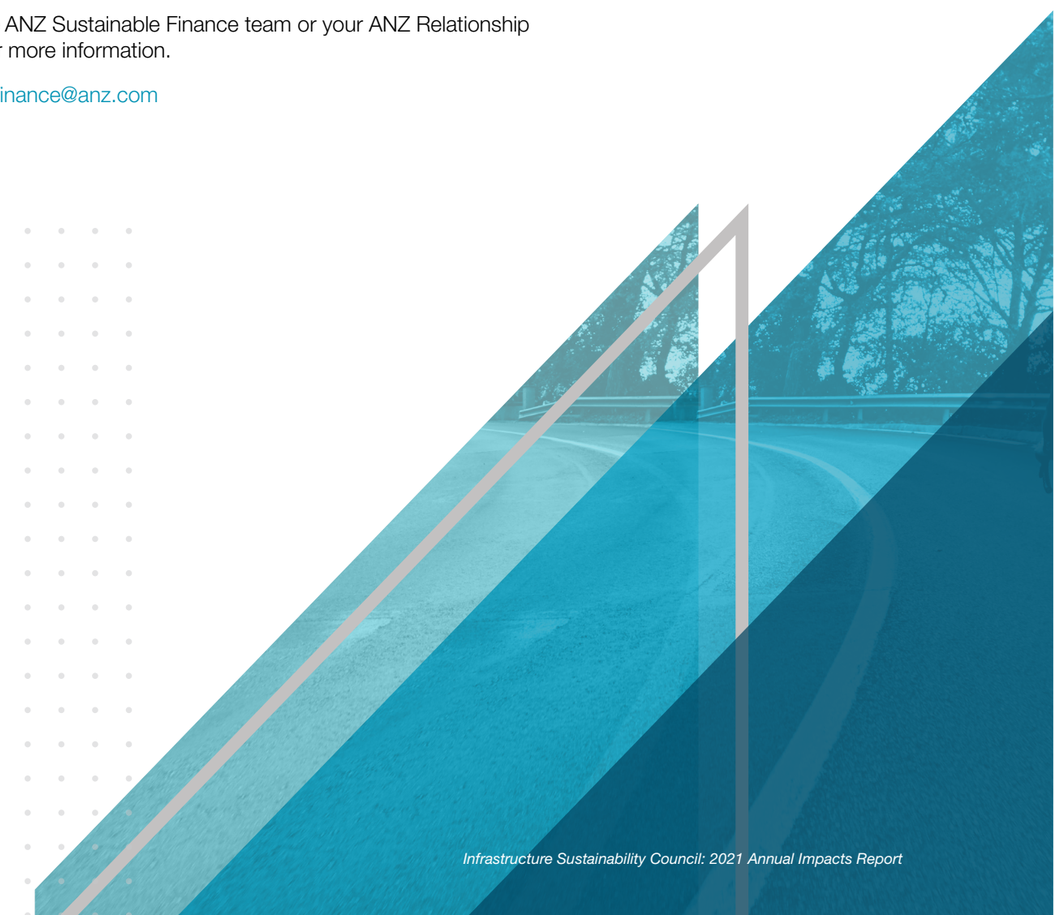


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USEFUL TERMINOLOGY

ISC	Infrastructure Sustainability Council (preparers of this report)
Outcomes	Direct, immediate effects of business practices, measured through environmental, social, economic and governance metrics; also known as the quadruple bottom line
Impacts	Indirect, long lasting, slow to emerge effects of business practices as experienced by recipients, evaluated through assessments and stories about the planet, people and their prosperity
SDG	Sustainable Development Goal of the United Nations Agenda 2030
GHG	Greenhouse gas

Unless otherwise stated, dollar values ($) are Australian currency and data relate to FY21 (1 July 2020 - 30 June 2021).

Foreword

The last 18 months have been some of the most challenging, but from adversity blossoms opportunity - for the infrastructure sector and the communities that it serves.



Alison Rowe, Chair



Ainsley Simpson, CEO

In January 2021, there was a rare event. In the blackest parts of the Blue Mountains, scarred by the fires from the summer of 2020, and amongst the emerging green shoots of regrowth, a sea of wiry, bobbing, daisy-like flowers was taking hold. Native Pink Flannel Flower *(Actinotus forsythii)* germinates and blooms only once or twice in a person's lifetime as it requires very specific conditions - fire followed by large amounts of rain. Those exact conditions had tested the communities of NSW just twelve months earlier. The emergence of this humble little flower is a metaphor for the opportunities that present, not by accident, but when all necessary conditions align, including adversity as a key change driver.

The outcomes and member stories shared in this Infrastructure Sustainability Council Impact Report demonstrate that, despite significant challenges in the past year, the ISC is growing strategically on many fronts and our collaborative community of contribution is generating social, cultural, environmental and economic returns for society through long considered planning, investment and commitment.

As Chair and CEO, we are very proud to present to you a refreshed Impact Report this year, symbolic of our new organisational strategy and the industry's increasing commitment to embed sustainability in every aspect of infrastructure. Three key themes emerge – investment, innovation and impact.

A Year of Investment

Through government commitments to an infrastructure-led recovery and shifting investment drivers leading to private investor interest in a range of assets, the infrastructure pipeline will support and address portfolio deficits across a range of asset classes and jurisdictions. Along with the increasing importance of ESG and achieving Net Zero, rising sector activity has increased uptake of the IS Rating Scheme from 48 to 55 new registrations in FY21, representing a capex of AU$19.3 billion. Long-term horizons and demand for credible partnerships have underpinned our membership base expanding 25% with over 200 members at the close of FY21.

The ISC membership is committed to sustainable infrastructure and values being involved in a collaborative peak body. Our members tell us that investing in sustainability is delivering benefits and driving a business case for change. In the FY21 Member Survey, respondents reported that the greatest benefit of ISC membership is enabling commercial outcomes, closely followed by the personal and professional benefit of connections, collaboration and capability growth. We will continue to deliver those benefits. While COVID-19 made face-to-face delivery a real challenge, we managed to exceed expectations with our Connect Conference in May 2021, bringing together members, guests, speakers and panellists, both in person and online, for a valuable day of networking, knowledge building and exchange of ideas. In response to increasing market demand, we have commenced on-boarding pioneer partners to pilot IS Essentials, a modified version of the IS Rating Scheme for projects with a capex under $100 million. The sector has been investing in capability, with 211 new Infrastructure Sustainability Accredited Professionals (ISAPs) accredited last year, broadening the base of practitioners investing in long-term outcomes. The ISupply Directory has expanded too, with a 10% increase in listings and use in FY21, connecting more sustainability-focused suppliers with projects and assets that are undertaking an IS Rating.

A Year of Innovation

The last financial year has been a time of innovation and evolution for the ISC. In July 2020, we launched a new organisational vision, purpose and strategy for delivering impact through four strategic goals. This report begins to track our progress against those goals, toward fulfilment of our vision of enabling a positive future for planet, people and their prosperity.

Innovation is a clear and consistent theme throughout the IS Rating Scheme. A core strategic focus this year has been the piloting and launch of ISv2.1 and we are especially grateful to the many industry reviewers, credit developers and Advisory Group members who generously donated their time to development, to those teams that piloted the Scheme and trialled individual credits and to the financial supporters.

We have had a determined focus on partnering and strengthening relationships to harness innovation for impact, pressing for an urgent shift toward low carbon, resilient and inclusive infrastructure. We are delivering a critical element of the Low Emissions Building Material Program with NSW Department of Planning, Industry and Environment, and actively supporting the Materials and Embodied Carbon Leaders' Alliance, part of the same program; we are exploring best practice in Net Zero and sustainability in the transport sector with Roads Australia and Australasian Railways Association; and we are growing our understanding of Net Zero outcomes through design and delivery with the Australian Constructors Association and Consult Australia, in partnership with Autodesk.

Throughout the year, we have continually advocated for sustainable infrastructure through contributions to key policies and strategies at state and national levels, including Australia's revised Infrastructure Strategy, the Australian National Climate Resilience and Adaption Strategy and the Aotearoa New Zealand He Pou a Rangi Climate Change Commission's draft strategy. Through the ISC Modern Slavery Coalition, we furthered our support to businesses to assess and address modern slavery in the road infrastructure supply chain, including commencing a pilot study.

A Year of Impact

In FY21, we certified twenty-six projects, including one Planning, thirteen Design, ten As Built and two Operations projects. Across these, we were delighted to present eleven projects with v1.2 Leading certification, eleven with v1.2 Excellent certification, two with v1.2 Commended certification, one with a v2.0 Gold certification and one with a v2.0 Silver certification.

Our monitoring of environmental and circular economy performance on IS-rated As Built projects shows that the IS Scheme is making a massive difference. For instance, IS-rated As Built projects over the last four years have avoided 64% of lifecycle energy GHG emissions and a further 40% of lifecycle materials GHG emissions compared to business-as-usual practices, representing 26.5 million tonnes of CO2e, equivalent to 5,522 wind turbines running for one year. Circular economy results are inspiring too, with the ten As Built projects that were certified in FY21 collectively diverting 14.5 million tonnes, or 95%, of project waste from landfill and ensuring the re-use of 97% of spoil.

The twenty-six case studies contained in this report are an inspiring snapshot of the commitments being made by our industry to ensure that all infrastructure delivers social, cultural, environmental and economic benefits. These are real-world examples, describing how sustainability practices can facilitate impacts for the planet, people and their prosperity. They are clear evidence that a positive transformation is occurring across the industry and that sustainability is not only delivering new business opportunities, but also productivity gains and efficiency outcomes through innovation and growing capabilities. Sustainability is a critical catalyst for industry transformation.

In closing, we would like to acknowledge and thank all of our members and partners for their commitment and passion to the ISC and the sustainable infrastructure movement. We also pay tribute to the late Menno Henneveld, one of our earliest directors, a true stalwart for infrastructure sustainability and a pioneering leader for our organisation. We will always be grateful to Menno for his unwavering commitment to our purpose.

The time is now, to steer toward the future we choose. It is time to invest, innovate and make an impact - together.

Executive Summary

Postive futures for the planet, people, their prosperity and the industry.

Influencing Outcomes

Infrastructure is *the* key enabler of our lifestyles, communities and economies. By ensuring that all infrastructure delivers social, cultural, environmental and economic benefits, our sector can help create a positive future for the planet, people and their prosperity. That is our purpose at the Infrastructure Sustainability Council (ISC).

We are thinking deeply about how we, as an organisation, can help influence policy, planning, procurement and practice to deliver the most necessary positive changes.

We have four main goals:

- drive global best practice through sustainability LEADERSHIP
- enable a connected, collaborative and ambitious THRIVING INDUSTRY
- advocate for change that supports rapid MARKET TRANSFORMATION
- ensure that we are a purpose led, inclusive, high-performing HEALTHY ORGANISATION

If we do this, our success will be our members' success, too, and we will begin to see assets and organisations **delivering quadruple bottom line outcomes –** environmental, social, economic and governance. This will **enable organisational prosperity, set people in our sector up for success and position our industry to address the macro-challenges of our time.** Ultimately, we aim to influence a critical mass of organisations and assets to deliver against quadruple bottom line benchmarks to **build a world-class industry** and generate the transformation of infrastructure needed for the lifestyles, communities and economies of future generations.

Pathways to Impact

While environmental, social, economic and governance outcomes lie within organisational sightlines, impact is an additional perspective on change that explores how organisational activities are experienced in the long term by the planet, by people and through prosperity. Impacts are the changes that quadruple bottom line outcomes are designed to facilitate, such as contributing effectively to the UN Sustainable Development Goals.

Impacts lie some way ahead. We may not be able to see them clearly or quickly, or attribute them easily to specific actions. Yet, **pathways to impact** lie immediately before us. Through the pathway of creating 'liveable communities', for instance, we can build Sustainable Cities and Communities (SDG 11) and forge Good Health and Wellbeing (SDG 3). Through the pathway of building a 'circular economy', we can develop sustainable Industry, Innovation and Infrastructure (SDG 9) and manage Responsible Consumption and Production (SDG 12). There are many such pathways to generating desirable impacts on **planet**, **people**, **prosperity** and the **industry**. Some others include 'conserved ecosystems', 'adaptive capacity', 'sustainability-aligned governance' and a 'healthy, inclusive workforce'.

We explore numerous pathways through four impact themes - planet, people, prosperity and the industry - across 26 industry case studies.

Structure of this Document

There are three sections:

- The Infrastructure Sustainability Council – who we are and how we are governed
- Setting our ambitions – how we are progressing against our strategic goals
- Pathways to impact – how the industry is expanding its perspective beyond outcomes to longer term impacts



Infrastructure Sustainability Council Impact Model

We make a difference through our focus on:

Our purpose

4 strategic goals

12 strategic objectives

5 member benefits

4 impact themes

17 SDGs



Highlights

ISC Strategic Highlights FY21

LEADERSHIP

55
registrations worth $19.3 billion

ISv2.1
Rating Tool launched

26
projects certified

THRIVING INDUSTRY

>400
attendees at largest ever ISC Connect Conference

▲7%
ISAP renewals

▲ 25%
membership
▲ 7%
member satisfaction

MARKET TRANSFORMATION

~288
stakeholder engagements

5
partnerships on climate change

▲ 42%
social media following

ORGANISATIONAL HEALTH

New
strategy, vision, brand, name and website

10
new team members in new geographies

100%
ISC emissions offset
45
women profiled for IWD

IS Rating Highlights FY21

55%
lifecycle materials GHG emissions avoided

43%
lifecycle energy GHG emissions avoided

46%
lifecycle energy use avoided

55%
lifecycle water use avoided

1.5Mt
As Built project materials with sustainability credentials

95%
waste diverted from landfill

97%
of spoil re-used

Innovations:
2 WORLD FIRST
16 NATION FIRST
12 REGION FIRST

Certifications:
1st Planning
13 Design
10 As Built
2 Operations



01 The Infrastructure Sustainability Council

Who we are

The Infrastructure Sustainability Council is Australia and Aotearoa New Zealand's authority on sustainable infrastructure projects and assets.

What we do

Our purpose is to ensure that all infrastructure across Australia and Aotearoa New Zealand delivers social, cultural, environmental and economic benefits.

We strive to achieve our purpose through:

- Maintaining and developing an Infrastructure Sustainability (IS) Rating Scheme for planning, design, construction and operations of infrastructure assets
- Providing education, training and capacity building
- Connecting suppliers of sustainable products and services with projects through ISupply
- Bringing together experts to share knowledge and enabling a community of contribution
- Recognising and rewarding best practice

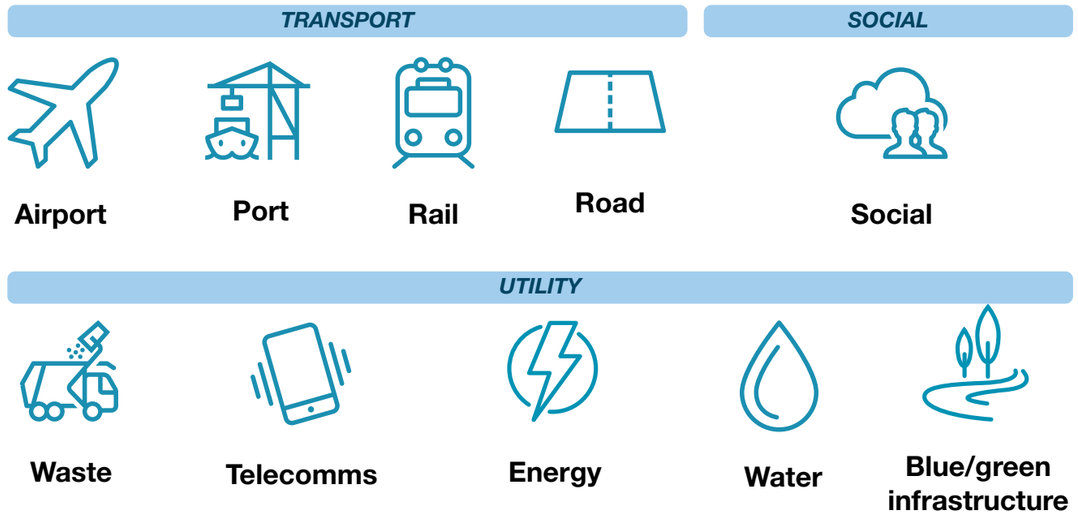
We work with a wide variety of infrastructure stakeholders throughout Australia and Aotearoa New Zealand, bringing them together to better understand the emerging sustainability issues facing our sector and our communities.

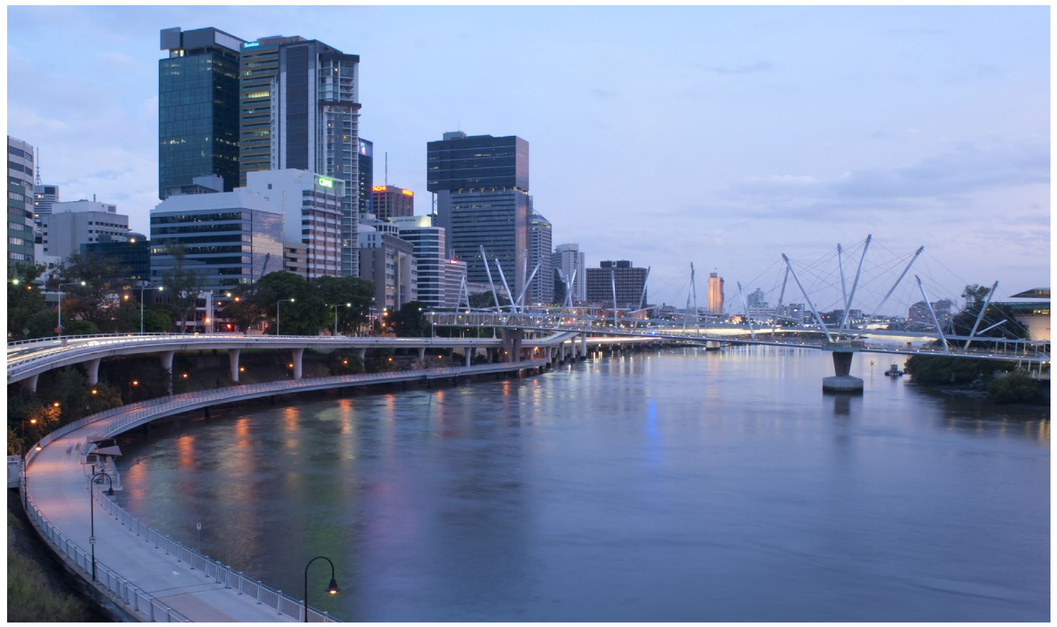
1. Asset owners and proponents
2. Financial providers and insurers
3. Suppliers, contractors and consultants
4. Delivery agencies and operators
5. Policy makers, regulators and local governments
6. Industry bodies, not-for-profits and academia

How we work

Our strength is the breadth of knowledge and experience of our members on issues that are material to the infrastructure industry and their continually evolving expertise on how to embed sustainability solutions into the value chain.

We work across a broad spectrum of assets including transport (airports, ports, road and rail), utility (energy, water, blue/green infrastructure, waste and telecommunications) and social assets.





IS Council Governance

Board Structure

The Infrastructure Sustainability Council Board plays a critical role in the strategy, governance and accountability of the ISC. Our Board meets quarterly, reviews forward strategy annually in December, looks back on performance against strategy annually in August and holds an Annual General Meeting in November.

We welcomed 5 new directors in FY21: three member directors, Julie Morgan, Finton Robertson and Glenn Hedges; two independent directors, Jeremy Stone and Bethia Gibson; and company secretary Jody Williams. Three members retired in the year: Marko Misko, after serving two terms, Ben Schnitzerling and Monique Cornish.

Three committees report to the board. The Finance, Audit and Risk Committee assists the board to fulfil its overall responsibilities in relation to finance, audit and risk management matters arising out of current activities and future opportunities undertaken by the ISC. The Market Development Committee supports the executive and team members, overseeing market development, new products and services and stakeholder engagement, including digital product management, our training and capability approach and business development strategy. The Governance and Nomination Committee oversees governance of the ISC.

The Board responded strongly to meet the organisation's needs through the impact of COVID-19. This included increasing oversight and holding more regular meetings during the year. The Board also oversaw the review and release of the Design and As Built Rating Tool from ISv2.0 to ISv2.1.

Our Board Members



Alison Rowe – Chair, Independent Director

Alison is Managing Director Australia of The Nature Conservancy and is fully committed to environmental sustainability, including global responsibility for strategy development, delivering transformational programs, commercialising new business models, community development and advocacy. Prior to this role, Alison was the Global Executive Director Sustainability at Fujitsu.

Alison's non-executive director experience includes the Future Business Council (chair for 2 years), Climate Alliance, Australian Energy Foundation, Bioregional Australia, Environment Victoria and One in Five. Alison uses her experience in the energy, transport, infrastructure and technology industries in the private, public and not-for-profit sectors to lead with a strong focus on values, relationships and collaboration.



Sarah Marshall – Deputy Chair, Member Director

Sarah is General manager – People, Safety and Sustainability at Fulton Hogan. She has 25 years' experience in the construction sector having also worked at Lendlease and CPB Contractors in management roles that combined environmental, community and sustainability remits.

Sarah spearheads positive social change in the industry - including improving awareness of mental health, as a Corporate Ambassador for beyondblue, increasing indigenous engagement and improving diversity - for which she has received numerous industry accolades, including Winner WME Corporate Sustainability Leader 2014. Sarah is on the board of the Australian Constructors Association and was previously on the NSW Architects Registration Board.



Matthew Brennan – Member Director

Matthew is Head of Sustainability at Transurban, where he has worked since 2015. Prior to this role, he worked in sustainability and environmental management roles in Australia and the United Arab Emirates, including for Stockland and Sydney Water.

Matthew has nearly 30 years' experience in the infrastructure sector covering transport, water and power in both the public and private sectors and has first-hand knowledge of unlocking the benefits of a strong sustainability agenda through leveraging sustainability performance on projects. He combines sustainability and infrastructure knowledge to understand key sustainability risks and opportunities and champions the Sustainable Development Goals.



Dorte Ekelund – Independent Director

Dorte is the Strategic Advisor – Office of CEO with SMEC. She is an urban and regional planner with 30 years' experience in land use and infrastructure planning across all levels of government in various jurisdictions, including as Head of the Australian Government Major Cities Unit, ACT Director-General of Environment, Planning and Sustainable Development, and WA Deputy Director-General of Planning and Infrastructure.

Dorte's experience includes water, energy, renewable energy and climate change mitigation and adaptation. She is a director of ICON Water and Committee for Sydney, a Commissioner with the Northern Territory Planning Commission and Adjunct Professor at the University of Canberra. She is a member of the GBCA Green Star Advisory Committee, University of Wollongong Smart Infrastructure Advisory Council and the Australian Institute of Company Directors.



Leo Coci – Member Director

Leo is Executive Director of the Office of Major Transport Infrastructure Delivery at Main Roads Western Australia, part of the Department of Transport in the Government of Western Australia, where he has worked for more than 40 years.

Leo is an engineer, with expertise in bridge design, road planning, project management and contract management of major projects, and is now responsible for the procurement and delivery of AU$8 billion of priority infrastructure, including Metronet rail projects, such as Thornlie-Cockburn Link, Yanchep Rail Extensions, Morley-Ellenbrook Line, Bayswater Station, Byford Rail Extension and Level Crossings Removal. In his leadership role in major projects and the implementation of innovative contract procurement models, Leo champions sustainability and is a member of the Aboriginal Advisory Group.



Julie Morgan – Member Director

Julie is the Executive Director Environment and Sustainability at Transport for NSW, which has a portfolio of major infrastructure delivery throughout the State, and uses the IS Rating Tool to drive innovation and sustainable outcomes across projects and assets. Julie holds a key sustainability leadership role and is a strong advocate, ensuring that early project decisions translate into sustainable outcomes.

Julie is a lawyer by profession, with 25 years' experience in the public sector developing and implementing strategy, managing and delivering large and complex projects, and establishing centres of excellence to support operations. After a decade in legal practice with the NSW Director of Public Prosecutions and Legal Aid NSW, Julie spent 11 years at NSW Ambulance, leading strategy and change programmes prior to joining Transport for NSW in 2017.



Glenn Hedges – Member Director

Glenn is the Sustainability Manager on the Cross River Rail program of works, including on the Tunnel, Stations and Development public-private partnership and the Rail, Integration and Systems alliance. Glenn has 25 years' environmental and sustainability experience in infrastructure and building delivery across the UK, New Zealand and Australia, including 15 years within the CIMIC Group.

Glenn was a founding non-executive director and company secretary (to 2011) of the Australian Green Infrastructure Council, which has become the ISC, and has directly assisted more than 20 projects in achieving their IS Rating. His experience across a range of assets, his inhouse knowledge and his subject matter expertise combine to provide the ISC with insights into the practical change drivers influencing sustainability across planning, procurement, delivery and operations on major projects.



Jeremy Stone – Independent Director

Jeremy is the CEO of advisory and investment company Vaysh, which focuses on technology, smart infrastructure, energy transition and the circular economy. An engineer, Jeremy has 30 years' of local, Asia and UK experience in the public, private and not-for-profit sectors, with an emphasis on innovation and creativity. Previously, he was the Regional Director Asia and global head of Innovation and Digital at GHD.

Jeremy has 15 years of board experience, including currently as a non-executive director at J-Power Latrobe Valley, a consortium of private organisations and the Japanese, Australian and Victorian governments that is implementing a AU$500 million pilot of the world's first liquid hydrogen supply chain.



Finton Robertson – Member Director

Finton is a Director of Sustainable Asset Strategies, a private consultancy that has been a member of the ISC for more than five years. He has 20 years of public and private sector experience on all phases of capital works projects, from business case to handover, in road, rail, water, ports, commercial, defence, health and energy projects.

Finton's roles have included Sustainability Lead on the Victorian Government's Level Crossing Removal Project, and he has been involved in some of the highest IS Rating scoring Design and As Built projects to date. As well as his involvement in the development of iterations of the IS Rating Tool, he has been involved in the development and piloting of numerous other rating schemes, including BREEAM (UK), LEED (US), Vic Roads INVEST and SMREP (for rail projects).



Bethia Gibson – Independent Director

Bethia is the General Manager Operations at Mana Arotake Aotearoa Audit New Zealand, a leading provider of audit and assurance services to the public sector. Bethia has been in this role since 2007.

Bethia's previous role was Deputy Commissioner, Corporate Services in the State Services Commission. Early in her career she was a registered valuer at Valuation New Zealand and she was involved in establishing Quotable Value New Zealand, where she worked as a General Manager. Bethia is a lay member on the New Zealand Institute of Chartered Accountants' Disciplinary Tribunal and a member of the Code Disciplinary Committee of the Financial Services Council New Zealand.



Jody Williams – Company Secretary

Jody is a Special Counsel at MolinoCahill Lawyers, where she practices construction, infrastructure and insurance law, primarily in the management of project claims and resolution, applying her extensive experience in insurance law and professional indemnity.

Jody is a member of the Victorian Bar and a member of the Law Institute of Victoria Environmental Issues Committee. Her publications include Sustainable Construction: Developments and Opportunities, 2016, which was a Commended entry in the Brooking Prize. Jody also lectures at the University of Melbourne in construction law and sustainable infrastructure systems, teaching on the course for Master of Construction Law, Planning and Building Sustainable Cities.



02 Setting our Ambition

Setting Our Ambition

Our Strategy FY21-FY25

Our purpose is to ensure that all infrastructure across Australia and Aotearoa New Zealand delivers social, cultural, environmental and economic benefits. Our strategy FY21-FY25 was set following two years of focus groups, culminating in an intensive two days of planning with the board of directors. We have four strategic goals to be delivered through twelve strategic objectives – with a very clear idea of what success will look like.

Our strategic plan is reviewed annually, including a look back at feedback and a look forward at trends, risks and opportunities. This forms the foundation of our business plan and choice of key performance indicators. Our annual performance is measured between 1 July and 30 June, and we review our performance against KPIs in August each year with the Board.

Our Strategic Goals

1 LEADERSHIP

Drive global best practice in infrastructure

2 THRIVING INDUSTRY

Enable the industry to be connected, collaborative and ambitious

3 MARKET TRANSFORMATION

Advocate for change that supports industry to rapidly transition

4 ORGANISATIONAL HEALTH

Be purpose-led, inclusive and high performing organisation

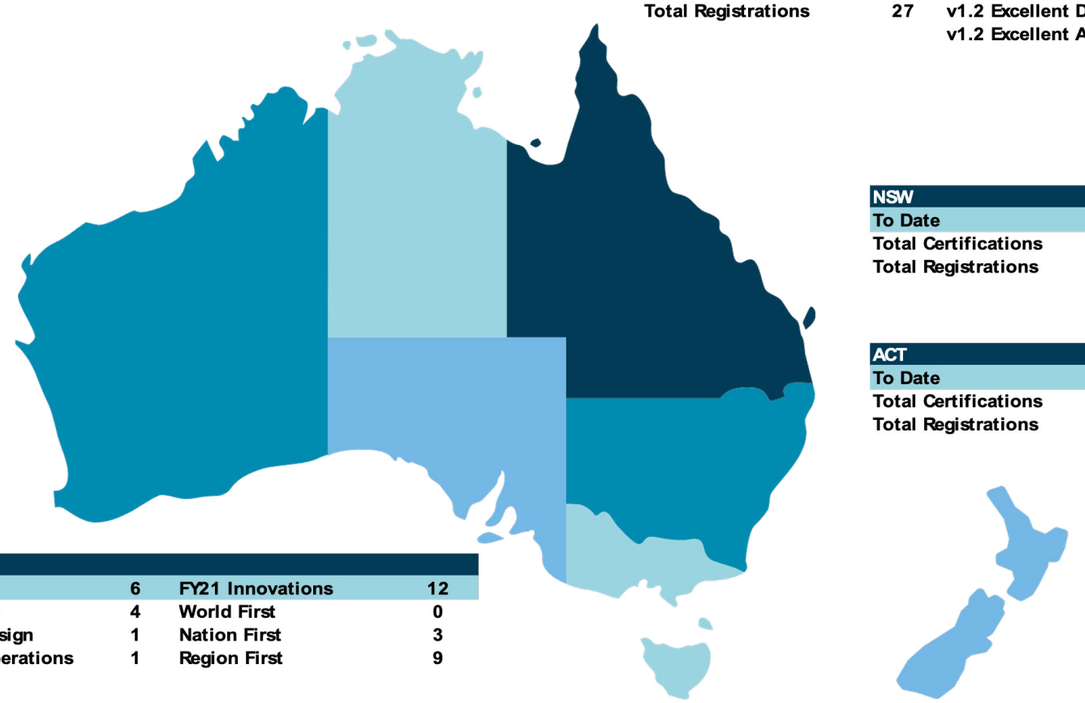
GOAL 1

Leadership | Kaitiakitanga

IS Awards by Region

WA					
To Date		FY21 Certifications	2	FY21 Innovations	0
Total Certifications	14	v2.0 Silver Planning	1	World First	0
Total Registrations	23	v1.2 Excellent Design	1	Nation First	0
				Region First	0

QLD					
To Date		FY21 Certifications	5	FY21 Innovations	4
Total Certifications	22	v1.2 Leading Design	1	World First	0
Total Registrations	27	v1.2 Excellent Design	3	Nation First	2
		v1.2 Excellent As Built	1	Region First	2



NSW					
To Date		FY21 Certifications	8	FY21 Innovations	9
Total Certifications	40	v1.2 Leading Design	2	World First	1
Total Registrations	61	v1.2 Leading As Built	3	Nation First	8
		v1.2 Excellent Design	1	Region First	0
		v1.2 Excellent As Built	2		

ACT					
To Date		FY21 Certifications	1	FY21 Innovations	0
Total Certifications	4	v1.2 Excellent Design	1	World First	0
Total Registrations	3			Nation First	0
				Region First	0

VIC					
To Date		FY21 Certifications	6	FY21 Innovations	12
Total Certifications	35	v1.2 Leading As Built	4	World First	0
Total Registrations	45	v1.2 Commended Design	1	Nation First	3
		v1.2 Commended Operations	1	Region First	9

SA					
To Date		FY21 Certifications	1	FY21 Innovations	1
Total Certifications	6	v2.0 Gold Design	1	World First	0
Total Registrations	4			Nation First	0
				Region First	1

NZ					
To Date		FY21 Certifications	2	FY21 Innovations	4
Total Certifications	8	v1.2 Leading Design	2	World First	1
Total Registrations	12			Nation First	3
				Region First	0

TAS					
To Date		FY21 Certifications	1	FY21 Innovations	0
Total Certifications	1	v1.2 Excellent Operations	1	World First	0
Total Registrations	1			Nation First	0
				Region First	0

Drive global best practice in infrastructure

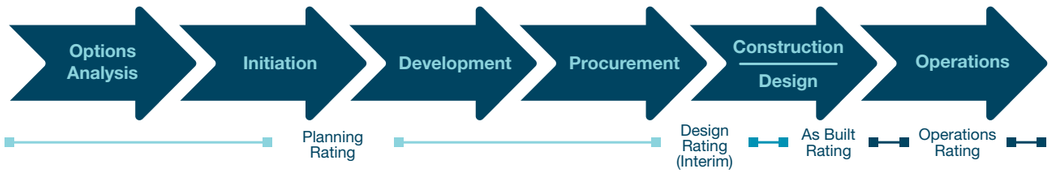
LEADERSHIP OBJECTIVE 1: RATINGS

Objective	What Success Will Look Like
Provide industry with a valued Rating Scheme that promotes continuous improvement and innovation	People who work in the infrastructure industry in Australia and Aotearoa New Zealand stand proudly behind their position as global leaders in sustainable infrastructure. They understand the importance of continuous improvement and outcompete their own performance in every project and asset they work on or manage. The IS Rating Scheme is the standard widely embraced by all sectors and people working at all levels of the industry. It is an accessible, digital and cost-effective tool that is globally acclaimed. It is widely praised for its genuine approach to intergenerational wellbeing. It fosters partnership and integrates Indigenous, mana whenua and First Nations values across the Scheme, enabling broader long-term outcomes.

The IS Rating Scheme

The Infrastructure Sustainability (IS) Rating Scheme rewards the sustainability performance of infrastructure assets. The Scheme is intended for use by stakeholders, including infrastructure owners, designers, constructors and operators, to benchmark and drive best-practice sustainability in planning, design, procurement, construction, operation and maintenance of infrastructure.

The IS Rating Scheme is subject to continuous improvement and further development. We have recently launched the ISv2.1 Design and As Built Rating Tools, and we are currently piloting the IS Essentials Scheme for smaller projects under $100 million.



The Scheme covers four themes: Governance, Economic, Environmental and Social. Each theme has one or more categories and each category has one or more credits. (A list of ISv2.1 themes, categories, codes and credits is provided in the appendices.) To achieve a rating and to measure performance, the IS Rating Scheme has a point scoring system that is adjusted to fit the profile of each asset and its context. Recognising that every asset and project is unique, and to ensure that effort by project teams is focused on areas of greatest opportunity to drive sustainability outcomes, points are adjusted from their default position through a materiality assessment.

Use of the Rating Scheme

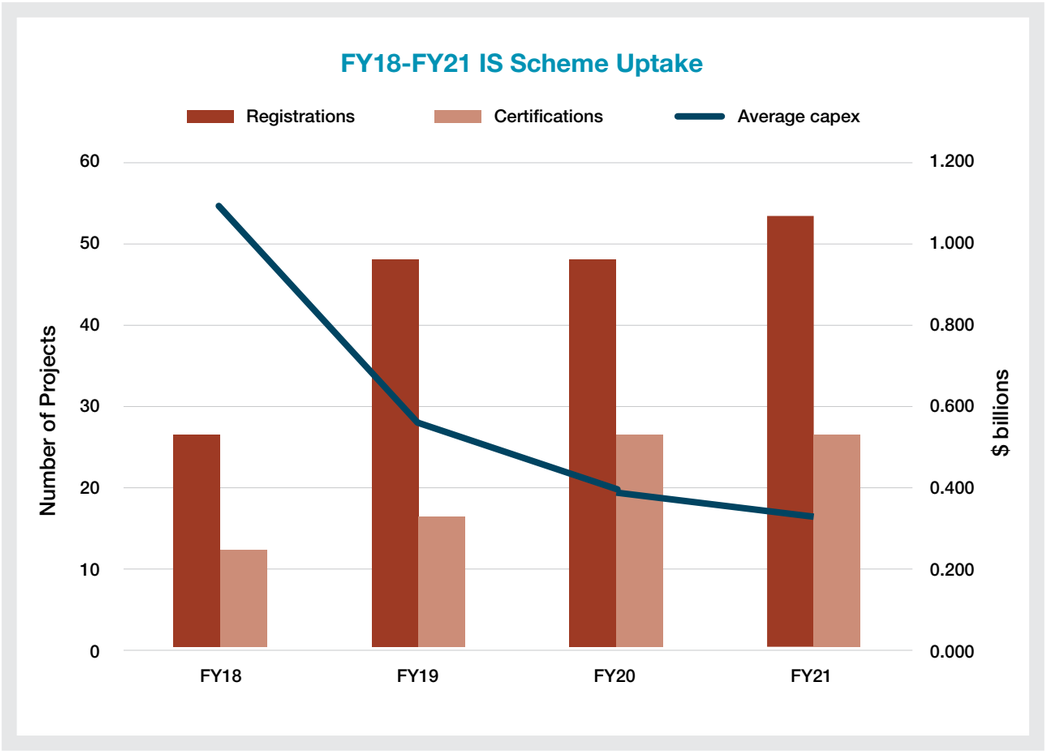
In the four year period FY18-FY21, a total of 176 projects with a total value of $93 billion were registered for an IS Rating. Annual registration activity grew from 25 registrations in FY18 and 48 in FY19 and FY20 apiece, to 55 in FY21.

In the same period, certifications have doubled from 13 in FY18 and 17 in FY19 to 26 in both FY20 and FY21 for a total of 82 certifications in the last four years.

Average registered project capex reduced from $1.08 billion in FY18 to $0.35 billion in FY21, reflecting an increase in the number of projects of various sizes being mandated for IS Rating. The average capex of projects registered across the last four financial years is $0.53 billion.

Rating Scheme uptake and throughput FY18-FY21

	FY18	FY19	FY20	FY21	Total
Number of registrations	25	48	48	55	176
Capex of registrations	$26.93 billion	$27.99 billion	$18.78 billion	$19.26 billion	$92.96 billion
Average registration capex	$1.08 billion	$0.58 billion	$0.39 billion	$0.35 billion	$0.53 billion
Number of certified projects	13	17	26	26	82

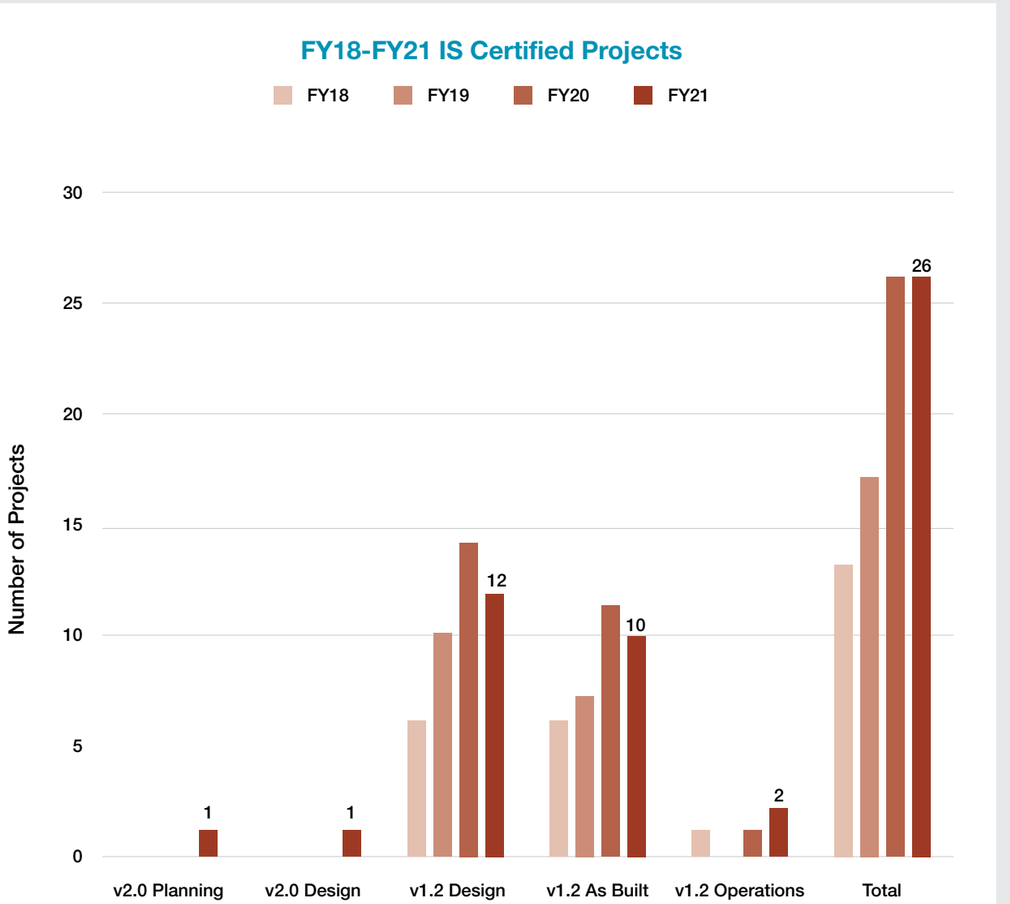


Nearly half (47%) of all registration capex, FY18-FY21, relates to road projects, while 40% relates to rail projects. The remainder relates to water (5%), ports (4%), cycleways/footpaths (2%) and, finally, correctional facilities (<1%) and open spaces (<1%).

Just over one third (35%) of all registration capex, FY18-FY21, are in NSW, 26% are in Victoria, 15% are in Queensland, 13% are in Western Australia and 7% are in Aotearoa New Zealand, while South Australia accounts for 2% and ACT and Tasmania account for 1% each.

Certifications FY18-FY21

There has been steady growth in the number of projects completing an IS certification since the IS Scheme's establishment; in fact, certifications doubled from 13 in FY18 to 26 in FY21. In the four year period, FY18-FY21, 82 projects were certified, including one Planning project (v2.0), 43 Design projects (v2.0 and v1.2), 34 As Built projects (v1.2) and four Operations projects (v1.2). In FY21, certifications included one Planning project (v2.0), 13 Design projects (v2.0 and v1.2), ten As Built projects (v1.2) and two Operations projects (v1.2). (FY21 certified projects are listed in the appendices).



LEADERSHIP OBJECTIVE 2: DATA-DRIVEN PERFORMANCE

Objective	What Success Will Look Like
Enable the accurate comparison of sustainability performance of infrastructure	The ISC works closely with the industry to create a standardised way to accurately quantify and consistently compare the sustainability performance of infrastructure. Performance data and insights drive better decision-making and drive positive change and healthy competition in the market. The platform continues to develop in collaboration with local and international peers and has become a cornerstone of the ISC's ever increasing global reputation.

Rewarding good practice in a rapidly evolving market

The IS Rating Scheme is designed to recognise and reward sustainability performance of infrastructure assets across their lifecycle. In order to do this effectively, the ISC must ensure that the performance thresholds rewarded with the IS Rating Scheme are benchmarked to industry performance. We do this through the use of data analytics and through extensive consultation with our membership base. In recent years, we have seen rapid development of the industry's performance, and have reflected this in the ISC's latest Design and As Built v2.1 Rating Tool. The ISC is transitioning to digital platforms, where we will more regularly update our Scheme, Tools and performance thresholds to reflect market change.

Circular economy outcomes

Each year, we monitor circular economy outcomes for As Built certified projects. In FY21, there were 10 As Built certified projects – six rail and four road projects; five in NSW, four in Victoria and one in Queensland; seven IS Leading and three IS Excellent – with an average IS score of 74.4. (FY21 certified projects are listed in the appendices).

Circular economy outcomes across As Built certified projects FY21

		Tonnes	%
Sourcing	Materials with sustainability credentials	1,580,021	
	Recycled asphalt (RAP) content		2%
	SCM content in concrete		29%
	Recycled aggregate content		50%
Efficiency	Reduction in asphalt from base case	209,067	25%
	Reduction in plastic from base case	(6,896)	(7%)
Resource Outputs	Waste diverted from landfill	14,549,856	95%
	Office waste further processed	75,557	41%
	Spoil re-used on or off site	13,930,504	97%
	Material sent for further treatment	772,464	

Materials can include aluminium, asphalt, bitumen, concrete, crushed rock, sand, wood products, glass, steel, timber and metals. Across nine of the ten FY21 As Built certified projects (material use data was not verified on one project), more than 1.5 million tonnes of material used had a sustainability credential, of which nearly 70% related to one project.

Projects of note include *Ballarat Line Upgrade, an IS Leading, $500 million rail project in Victoria, which used 1.08 million tonnes of sustainability credentialled material.*

Recycled asphalt product (RAP) is old asphalt crushed to aggregate sizes and reintroduced to hot mix asphalt. RAP was used on two projects only, at rates of 20% and 32%, which results in a 2% rate across all projects.

Projects of note include *LXRP WPA - Aviation Road & Wyndham Vale Stabling, an IS Leading, $200 million road project in Victoria, which used asphalt with a 32% RAP content.*

Supplementary cementitious materials (SCMs) include fly ashes, slag cement and silica fume, which can be substituted for Portland cement. Across ten As Built projects, the range of SCM content ranged from 25% to 35%, with an average of 29%.

Projects of note include *CBD & South East Light Rail, an IS Leading, $1.2 billion rail project in NSW, which used concrete with a 33% SCM content.*

Recycled aggregate includes crushed blast furnace slag, crushed concrete and masonry, crushed glass, recycled asphalt used as fill and general fill or spoil. Content varied from 1% to 91% across the ten projects, resulting in an average of 50%.

Projects of note include *LXRP Package 4 - CD9 Caulfield to Dandenong, an IS Leading, $1.4 billion rail project in Victoria, which used 91% recycled aggregate.*

Reduction in asphalt from the base case was 25% overall; however, this ranged widely across the projects. One project reduced asphalt by more than 40%; two projects used between 16% and 18% less asphalt. On the other hand, two projects used more asphalt than the base case.

Projects of note include *Pacific Motorway Upgrade - M1/M3/Gateway Merge, an IS Excellent, $170 million road project in Queensland, which made a 179,693 tonnes (42%) reduction in asphalt from the base case.*

Reduction in plastic from the base case was, on average, not achieved, with an overall 7% increase. While two projects saw a reduction in use of plastic, such as pipes, three projects used significantly more than the base case and on five projects, plastic use was not measured.

Projects of note include *Pacific Motorway Upgrade - M1/M3/Gateway Merge, which made a reduction of 117 tonnes (70%) in plastic use from the base case.*

Waste diverted from landfill was extremely high, at 95% of total waste, amounting to 14.5 million tonnes. Six projects diverted virtually all waste, one project diverted two thirds and one project diverted one third.

Projects of note include *LXRP NWPA - High Street Reservoir, an IS Leading, $230 million rail project in Victoria, which diverted 61,817 tonnes (100%) of waste from landfill.*

Office waste, such as paper and cardboard, was reprocessed at between 29% and 88% of total office waste, for an average of 41%.

Projects of note include *CBD & South East Light Rail, which sent 2,096 tonnes (88%) of office waste for further processing.*

Spoil re-use rates were high, ranging from 93% to 100% across the projects, for an average of 97%, relating to nearly 14 million tonnes of spoil.

Projects of note include *Westconnex - New M5 Main Works (Stage 2), an IS Leading, $3.8 billion road project in NSW, which re-used 7.5 million tonnes (95%) of spoil on or off site.*

Material sent for further treatment includes office waste, inert and non-hazardous waste and hazardous waste. This amounted to 772,464 tonnes across the ten projects.

Projects of note include *Northconnex, an IS Excellent, $2.65 billion road project in NSW, which sent 444,371 tonnes of material for further treatment.*

Environmental sustainability outcomes

We monitor environmental sustainability outcomes for As Built certified projects across four resource-use metrics: materials GHG emissions, energy GHG emissions, energy use and water use. Such sector benchmark data can be useful to organisations seeking to reduce their use of resources and their polluting emissions. It may also be useful information for organisations that are developing corporate climate strategies, mitigation plans and scenario plans in support of disclosures aligned with the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD).

In the period FY18-FY21, 34 As Built projects were certified. The majority of these projects were rail (15) and road (14), along with five others. In all, 18 As Built projects were certified as Leading, 14 were certified as Excellent and two were certified as Commended.

Across these As Built certified projects, there were very significant environmental sustainability outcome improvements against the overall base case. The base case is a suitable early design accepted by key stakeholders as representative of the original concept for the infrastructure development, accompanied by a set of business-as-usual assumptions regarding technologies, materials sourcing and composition.

Compared with the overall base case, there were 2.8 million tCO2e lifecycle materials GHG emissions avoided, 23.7 million tCO2e lifecycle energy GHG emissions avoided, 54.5 GJ of energy use avoided and 15.9 ML of water use avoided.

Resource use avoided across As Built certified projects FY18-FY21

	FY18	FY19	FY20	FY21	ALL	ALL
Lifecycle materials emissions avoided (tCO2e)	44%	25%	12%	55%	40%	2,825,870
Construction energy emissions avoided (tCO2e)[1]	36%	(43%)	35%	9%	(9%)	(142,086)
Operating energy emissions avoided (tCO2e)	16%	77%	23%	45%	67%	23,860,262
Lifecycle energy emissions avoided (tCO2e)	24%	24%	26%	43%	64%	23,718,176
Construction energy use avoided (MJ)[2]	22%	35%	8%	50%	39%	2,399,885,240
Operating energy use avoided (MJ)	15%	26%	20%	45%	27%	52,121,564,149
Lifecycle energy use avoided (MJ)	18%	27%	20%	46%	28%	54,521,449,390
Construction water use avoided (ML)	52%	13%	44%	48%	40%	5,520
Operating water use avoided (ML)	20%	49%	53%	62%	53%	10,333
Lifecycle water use avoided (ML)	52%	41%	47%	55%	48%	15,853

[1] Construction energy emissions were higher than the base case in FY19
[2] Construction energy emissions and construction energy use data are not necessarily aligned due to additional sources that have been accounted for in carbon models such as land use change and fugitive emissions.

Lifecycle materials emissions (tCO2e):
Lifecycle materials for As Built projects span construction, maintenance and use of the assets during their service life. Most materials-related GHG emissions occur through use of aggregates, concrete and steel and through the transportation of materials. Most relate to the construction phase, rather than the use phase. Opportunities for materials emissions reductions are to be found through the initial choice of infrastructure type to address the identified social need, the solution selected, innovations in construction processes and materials manufacturing processes and use of recycled materials.

IS Rating data for all As Built certified projects, FY18-FY21, show an overall 40% reduction in total lifecycle materials GHG emissions compared to the total from all base cases.

Projects of note include *Transport Access Program 3 (TAP3) - Wyee and Waratah Stations, a $25 million rail project in NSW, IS Leading certified in FY21, which reduced its materials emissions by 71% from the base case.*

Lifecycle energy emissions (tCO2e):
While lifecycle materials GHG emissions are incurred mostly during construction, the opposite is true for energy GHG emissions, with just 4% incurred during construction and 96% incurred during asset use - in the case of road, by vehicles and operating systems, such as ventilation and lighting, and in the case of rail, by trains and rail and station supporting systems, during the service life of the asset, which may be 50 years or more. Our data show that construction energy choices, while important, have a minimal effect on lifecycle energy GHG emissions compared with the choice of asset and the design of the solution.

IS Rating data for all As Built certified projects, FY18-FY21, (which do not currently track energy from road vehicles and trains), show a total construction energy GHG emissions increase of 9% and a total operating energy GHG emissions reduction of 67%, resulting in a total lifecycle energy GHG emissions reduction of 64%, compared to the total from all base cases.

Projects of note include *Port Drive Upgrade, a $100 million road project in Queensland, IS Excellent certified in FY19, which increased energy GHG emissions over the base case during construction (355,324 tCO2e), but reduced the operating energy GHG emissions of the asset by 91% (18 MtCO2e) from the base case.*

Lifecycle energy use (Mega Joules):
As Built project data show that 3% of energy use occurs during construction and 97% occurs during asset use. Operating emissions and energy use profiles will diverge with the electrification of transport, as GHG emissions will substantially reduce through use of electric vehicles, while energy use will not reduce as much.

IS Rating data for all As Built certified projects, FY18-FY21, show a total construction energy use reduction of 39%, a total operating energy use reduction of 27% and a total lifecycle energy use reduction of 28%, compared to the total from all base cases.

Projects of note include *Northconnex, a $2.65 billion road project in NSW, IS Excellent certified in FY21, which reduced its operational energy use by 79% from the base case.*

Lifecycle water use (Mega Litres):
Water use on As Built projects demonstrates an approximately 40:60 ratio between construction and operational phases. Steel production, for example, incurs a high water use per kilogram, as does rebar, concrete and bitumen. Water is also used by contractors to compact road layers, for dust suppression, to washdown plant and equipment, for landscape watering and for site amenities. For road assets in use, the water footprint per driven kilometre also considers fuel use. Electricity has a substantially higher water footprint than petrol. Water use in steel and operational fuel use is not reflected in IS data.

IS Rating data for all As Built certified projects, FY18-FY21, show a total construction water use reduction of 40%, a total operating water use reduction of 53% and a total lifecycle water use reduction of 48%, compared to the total from all base cases.

Projects of note include *Ballarat Line Upgrade, a $500 million rail project in Victoria, IS Leading certified in FY21, which reduced operational water use by 96% from the base case.*

LEADERSHIP OBJECTIVE 3: GLOBAL REACH

Objective	What Success Will Look Like
Develop enduring relationships with global governments, investor and private sector partners	The ISC focused its activity locally by anchoring the IS Rating Scheme and more comprehensively comparing sustainability performance in Australia and Aotearoa New Zealand, for all assets. The ISC has been able to expand its view to connect more with its global peers and deliver sustainability outcomes through international partnerships. All infrastructure - urban and regional, large and small, new and aging - is delivering more for communities.

This objective will be an area of increasing focus for the ISC in the coming years.



GOAL 2

Thriving Industry | Kotahitanga

Enable the industry to be connected, collaborative and ambitious

THRIVING INDUSTRY OBJECTIVE 1: COLLABORATION

Objective	What Success Will Look Like
Encourage industry to collaborate and act by showcasing leadership, sharing knowledge and building relationships	As a result of the ISC's membership program, members connect and collaborate by sharing deeply valuable, granular knowledge about how they have delivered better outcomes. The ISC's ISupply database is a well-utilised tool that accelerates mutually beneficial supplier relationships. The ISC provides a range of flexible training offerings to its members that delivers the desired learning outcomes for its multi-disciplinary audience.

During the year, more than 500 individuals engaged in our webinars, such as our Social Impact in Infrastructure webinar, listened to our new series of podcasts and attended ISAP Forums. Project case studies were shared at ISAP events and as part of the conference program. With strong partnerships established with trade publications like Roads and Infrastructure magazine, important industry news and updates were shared even more regularly. A high impact and very well attended virtual International Women's Day program was initiated across both Aotearoa New Zealand and Australia. There has also been a 10% growth in the year in ISupply listings and use.

The ISC Connect Conference in May 2021 brought together members, guests, speakers and panellists, both in person and online, for a day of networking, knowledge building and exchange of ideas. There were 32 speakers and over 400 registered attendees, including in-person attendees from across Australia, virtual attendees and guests who joined a shoulder event in Aotearoa New Zealand. The day included panel discussions on key industry topics, including Towards Net Zero, Building Capacity and Capability for the Future, Technology, Regional Growth, Climate Risk and Workforce Wellbeing and Circular Economy and Resilience - Finance, Government and Practical Action, Innovations and Impact.

'Since joining the ISC in 2018, the opportunities that the network provided has seen a clear growth in uptake of eMesh to 100% growth year on year and continuing. The ISupply platform is such a fantastic resource and eMesh has benefited from being a part, even better than I had ever imagined.'

Tony Collister, Innovation, Research & Sustainability Manager, Fibercon

THRIVING INDUSTRY OBJECTIVE 2: CAPABILITY

Objective	What Success Will Look Like
Build a stronger infrastructure workforce by developing skills and capabilities, and providing tools and resources	Our industry is more skilled, capable and empowered to serve the current and future societal needs of infrastructure.

Capability development during an infrastructure-led recovery has been a high priority for our members.

The Infrastructure Sustainability Accredited Professional (ISAP) community currently comprises 776 professionals accredited to implement and assess projects for IS Rating. They are dedicated to driving long term sustainability outcomes for their projects and organisations. We have ensured that suitable training options are available to support uptake of ISv2.1.

Having undertaken initial training and assessment led by industry experts, ISAPs are required to maintain and demonstrate their up-to-date skills and knowledge by completing an annual re-accreditation assessment. ISAPs are valued stakeholders, receiving access to all IS Rating Tools and resources, quarterly ISAP Forums at which the latest updates are addressed, fortnightly newsletters detailing upcoming events and training opportunities hosted by the ISC.

The ISC has supported an annual scholarship to an intern participating in the City Rail Link Progressive Employment Program.

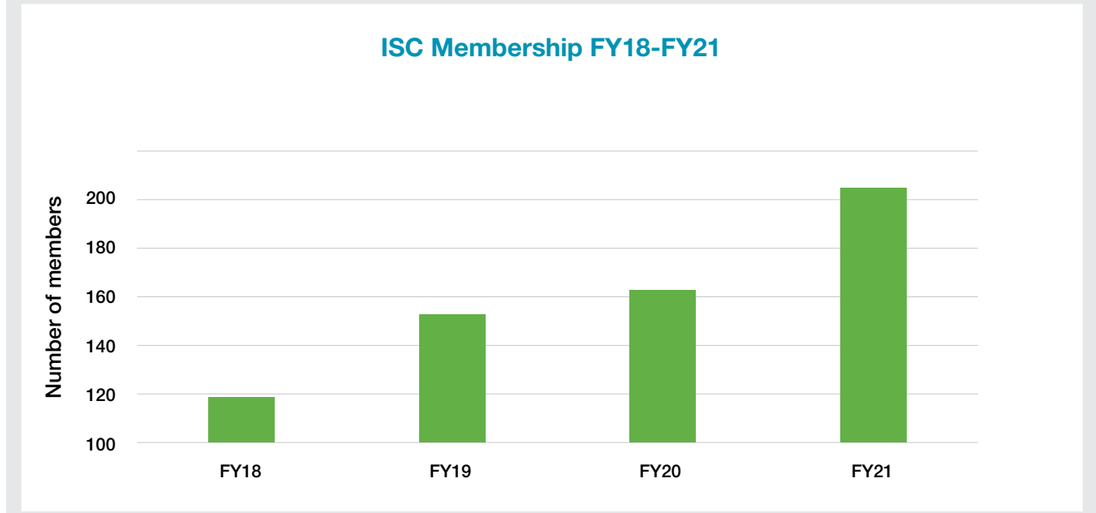
	FY21
ISAP renewals	up 7%
Total trained across all offerings	up 4%

We recognise that an infrastructure sustainability focus should not sit with sustainability professionals alone and that, in addition to IS for Professionals, there are wider infrastructure sustainability audiences to whom we are relevant. This is increasingly becoming an all-of-organisation imperative. FY22 will see us enhance our digitalisation and, supported now with a new Learning Management System, our priorities include taking a learner-first approach, offering multiple delivery modes to our target segments and diversification to a wider range of audiences, offering continuing professional development and accessing real-time data to better inform the strategy and decision making.

THRIVING INDUSTRY OBJECTIVE 3: MEMBERSHIP

Objective	What Success Will Look Like
Evolve the membership model to amplify value for all	The ISC has a tiered membership model in place that provides different members with benefits, tools, knowledge and opportunities that match their needs. As a result, its membership is strong, valued and representative of the whole infrastructure value chain.

ISC members are committed to sustainable infrastructure and value being involved in a collaborative peak body. Reflecting the rapidly evolving transition of the sector toward sustainable ways of doing business, our membership has nearly doubled in the last four financial years, with a rise of more than 25% in the past year. Member attrition is well below industry average at 10%, which reflects our emphasis on providing tailored benefits for all our members, no matter what their size or role in the value chain.



In FY20, we commenced a new approach to assessing member satisfaction, which we measured as 7.04 in FY20, rising more than 7% to 7.55 in FY21. We are aware of the high importance placed on smart, responsive collaboration and engagement. A critical development has been our annual plan to connect members with relevant other members, deliver quality knowledge sharing opportunities and promote innovation and impact.

While COVID-19 made face-to-face delivery a real challenge in FY21, we managed to lead a 1-day, national conference in May, which exceeded all market expectations. Throughout COVID-19 disruptions, we have responded to the challenge of ensuring that sustainability professionals can continue to consume quality content and, where possible, network digitally. We have prioritised the role of webinars and working groups, re-designed our fortnightly newsletter and increased our use of social media (LinkedIn, in particular). We have also built a new website that includes new and valued content.



GOAL 3

Market Transformation | Hurihanga

Advocate for change that supports industry to rapidly transition

MARKET TRANSFORMATION OBJECTIVE 1: ORGANISATIONAL CHANGE

Objective	What Success Will Look Like
Support members to integrate change through organisational strategy and operating procedures	ISC members have become highly successful change agents. They have improved performance by integrating sustainability throughout their organisations by using the Tools and resources developed by, and with, the ISC into the processes and systems used.

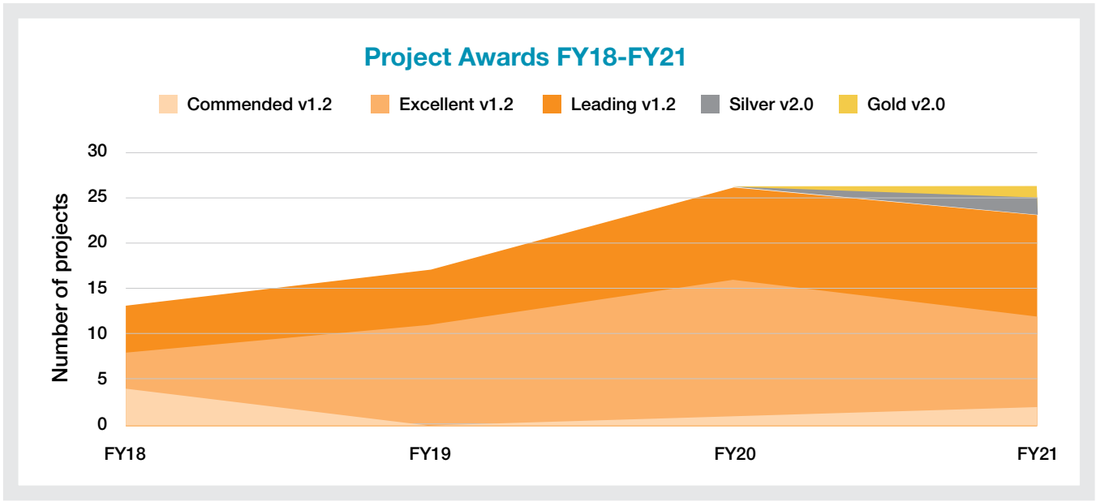
Project Awards

The IS Rating Scheme Rating Levels provide benchmarks to drive the improved sustainability performance of projects and assets. A project is rated out of 100 points, with 10 bonus points available for innovation. Scores reflect a variety of desirable outcomes, such as a better general performance across all rated criteria, very strong performance in the credits with the largest weightings or innovation.

The ISv1.2 Rating Tool, which is currently in most extensive use, has three award categories: Leading (75-100), Excellent (50-74.9) and Commended (25-49.9). The recently released ISv2.1 and ISv2.0 Rating Tools have five award categories: Diamond (95-100), Platinum (80-94.9), Gold (60-79.9), Silver (40-59.9) and Bronze (20-39.9).

Overall certifications were the same in FY21 as in FY20 (26), however FY21 awards were relatively higher, including one v2.0 Gold, one v2.0 Silver and eleven v1.2 Leading ratings.

In the last four financial years, FY18-FY21, there have been 82 certified projects, including 79 v1.2 certifications (seven Commended, 41 Excellent and 32 Leading) and two v2.0 awards (one Silver and one Gold).



Innovations

Innovation is the creation of better or more effective products, processes, services or technologies that are accepted by markets, governments and society. We categorise project innovations delivering significant sustainability benefits as Region First, Nation First or World First.

In FY21, there were 12 Region First, 16 Nation First and two World First innovation awards. Increasing traction in Region, Nation and World First innovations reflects growing demand for smarter ways of delivering infrastructure, reducing environmental impacts while promoting social progress.

World First innovation: WestConnex – New M5 Main Works – Stage 2 project. The Dry-Flo® process in tunnel construction and commissioning, rather than using the conventional wet testing method (using potable water) accepted by the tunnel construction industry to identify faults and leaks in the fire deluge system, instead replicates the flow of water, flowing low pressure, dried air into the deluge system. Widely used in the global oil and gas industry to prevent corrosion, it had not been used before in tunnel construction.

World First innovation: Central Interceptor project. Puketutu Island, a Māori heritage landscape and a place of strong cultural significance, is being rehabilitated using tunnel and shaft spoil.

	FY18	FY19	FY20	FY21	Total
Number of Innovations	35	7	23	30	95

A business case for change

We have begun exploring how we might leverage our Tools and capability to catalyse organisational change, and we see promising signs of more systemic, organisational change through the linking of sustainability to organisational benefits.

A Return on Investment (ROI) study published in 2020 was undertaken by RPS Group. The economic analysis found that infrastructure projects rated under the IS Rating Scheme will deliver up to $2.40 in benefit for every dollar invested.

From suppliers to government agencies, our members are regularly providing feedback on how investing in sustainability is delivering benefits and driving a case for business change. In the FY21 Member Survey, respondents reported that the greatest benefit of ISC membership is enabling commercial outcomes (3.9/5). Knowing that an organisation's greatest asset is its people, it is pleasing to note that the second greatest benefit of ISC membership is the personal/professional benefit of connections, collaboration and capability growth (3.8/5).

From our government members, we have also seen a shift from sustainability being largely within the remit of the design and delivery of a project, to being more firmly embedded in the asset DNA at business case and planning stages, as well as through the lifecyle of operations. In FY21, Western Australia and Victoria signalled a shift to join Queensland in considering the quadruple bottom line in the planning phase of assets. We also saw our largest number of registrations for an Operations Rating, with 6 assets registering in FY21.

'Vital Chemical has gained significant, broad-reaching benefits from our membership with the Infrastructure Sustainability Council. Our values have always aligned with authenticity, transparency and environmental efficacy, however shining a spotlight on sustainability across all business functions has allowed opportunities for innovation and challenging engrained behaviours, which ultimately leads to improved sustainability outcomes. We're thrilled to be publishing Environmental Product Declarations for our products in the coming weeks.'

Paul Gofton, General Manager Business Development and Sustainability, Vital Chemical

MARKET TRANSFORMATION OBJECTIVE 2: SYSTEMIC CHANGE

Objective	What Success Will Look Like
Mobilise industry leaders to advance policy, standards and specifications for low carbon, resilient, inclusive infrastructure	The ISC has effectively partnered with others to advance policy, standards and specifications. This promotes and advances planning, procurement and practices that enable low carbon, resilient and inclusive infrastructure. It has successfully established a sound delivery model that has enabled this important work.

Throughout FY21, we have had a determined focus on partnering and strengthening relationships to harness innovation for impact, pressing for an urgent shift toward low carbon, resilient and inclusive infrastructure and developing a plan to accelerate market transformation.

Partnerships

We have been establishing and working in partnerships to improve collaboration and alignment and accelerate results, including with:

- the Department of Agriculture, Water and the Environment – increasing uptake of recycled materials in line with the National Waste Policy Action Plan through the development of a recycled materials innovation challenge
- the NSW Department of Planning, Infrastructure and the Environment – scaling best practice measurement and uptake of low emissions building materials
- Transport for NSW – opportunities for recognising and rewarding provisions for reducing congestion and improving health by encouraging active transport
- the Department of Transport and Roads QLD – providing assurance, efficiency and best practice through alignment of the Materials Calculator with ARRB's Sustainability Assessment Tool
- the Materials and Embodied Carbon Leaders' Alliance (MECLA) – collaborating to create an enabling ecosystem for low emissions building materials through participation on working groups

Climate action and resilience

Climate action and resilience is a core focus of our market transformation and advocacy work. Our Climate Policy & Position, recognises the need for an urgent shift toward low-carbon, climate resilient infrastructure, and we have delivered on a number of actions outlined in that commitment:

- embedding climate action and investment in resilience into the IS Rating Scheme, as well as reviews of IS Planning and Operations and the development of IS Essentials
- progressing awareness, knowledge sharing and collaboration around resilience and adaptive capacity through our premier event for the year, the ISC Connect Conference in May 2021

In FY22, we will continue to build partnerships across the value chain to develop knowledge sharing. Upcoming thought leadership includes collaboration with Roads Australia and Australasian Railway Association on integrated sustainable transport best practice to accelerate to Net Zero, and with Australian Constructors Association and Consult Australia, supported by Autodesk, on how design and construction of infrastructure can support Net Zero delivery.

Advocating for sustainable infrastructure

We are committed to growing awareness around sustainability by sharing best practice, expert knowledge and insights. In FY21, the ISC team engaged 288 different stakeholders to help progress the sustainable infrastructure movement throughout Australia, New Zealand and beyond. Throughout the year, we participated in key policy consultation processes to advocate for further integration and alignment of sustainability principles into policy, planning, procurement and practice. This included the development of Infrastructure Australia's revised Infrastructure Plan, the Australian National Climate Resilience and Adaptation Strategy, the Aotearoa New Zealand He Pou a Rangi Climate Change Commission's draft strategy, the Pathway to Infrastructure Resilience principles released by Infrastructure Australia and Infrastructure NSW, whose approach strongly correlates with the IS Rating Scheme, and many other policies and strategies at state and territory level.

Collaborating to address modern slavery in infrastructure

We work collaboratively with a number of our members through the ISC Modern Slavery Coalition for Roads to strengthen our industry's response to modern slavery. Established by the ISC in 2019 to support businesses to assess and address modern slavery risks in the road infrastructure sector, the Coalition focuses on supporting collaborative solutions to modern slavery risk management, driving industry good practice to support compliance with the Modern Slavery Act and building members' capacity to manage modern slavery risks. As part of its work program during FY21, the Coalition engaged with PPE and bitumen suppliers as pilot supply chains to understand potential modern slavery risks associated with the procurement of these products.

Developing a plan to accelerate market transformation

A key investment this year was in the establishment of a new advocacy function to lead the delivery of policy, thought leadership and partnerships. Preliminary work included the development of the functional strategy and plan, and planning for the engagement of member-based Working Groups to improve collaboration and collective knowledge sharing action on key sustainability issues.

MARKET TRANSFORMATION OBJECTIVE 3: SOCIETAL AWARENESS

Objective	What Success Will Look Like
Showcase the social benefits of rated infrastructure to create greater public awareness and support	Across the infrastructure industry, the ISC communicates effectively through a clear plan and focused use of all its communication channels. ISC consistently produces credible, understandable and engaging stories about successful sustainable infrastructure projects that are shared widely by those who campaign to raise broader societal awareness.

Our senior leadership team's engagements in FY21 included meetings with members and industry leaders, webinars, speaking at events as a key note speaker or panellist and presenting at certification events.

With a keen focus on sharing all our strategic developments and quality content from our members, our social media following is up 42%, alongside an impressive engagement rate.

Our podcast Shaping Nations, launched in June 2021, invites leaders, thinkers and influencers to speak on a broad range of topics. Guests have included The Honourable Andrew Constance, Minister for Transport and Roads NSW, Romilly Madew, CEO of Infrastructure Australia, Commissioner Shane Fitzsimmons, Commissioner for Resilience NSW and Jon Davies, CEO of the Australian Constructors Association.

We regularly host ISAP Forum discussions to present our business improvement projects and innovations, with a particular focus on the IS Rating Scheme.

GOAL 4

Organisational Health | Manaakitanga

Be a purpose-led inclusive and high performing organisation

ORGANISATIONAL HEALTH OBJECTIVE 1: OPERATIONS

Objective	What Success Will Look Like
Enhance operational efficiency, practice good governance and make sound financial decisions	The ISC's operations are sound and sophisticated as they are built upon robust and straightforward technology solutions. Everyone is committed to professional learning and personal growth, which matches their aspirations and supports the organisation's ongoing success.

With a well-considered and intentional Strategic Plan in place, the Board approved a review of the operating structure to align our brand and business goals. This acknowledged our vision, outcomes and impact and informed the approach to our future identity, aligned with purpose. It also recognised that we operate beyond Australia, and the need to respectfully acknowledge the commitments and contributions from our members and stakeholders in Aotearoa New Zealand.

At our August AGM, we formally updated our name and constitution to reflect our operating footprint.

Our company name changed from the Infrastructure Sustainability Council Australia (ISCA) to the Infrastructure Sustainability Council (ISC).

Our Constitution needed to be amended to reflect this change and we considered what this meant for the alignment of Governance. While the Company's existing Constitution was adopted on 31 July 2020, and is available on our website, we undertook a further review in FY21 to identify any necessary amendments to reflect our operations in Aotearoa New Zealand. Revised clauses allow for a fair and reasonable representation of the Company in Aotearoa New Zealand. An additional revision provides clarity on when an Independent Director's term commences.

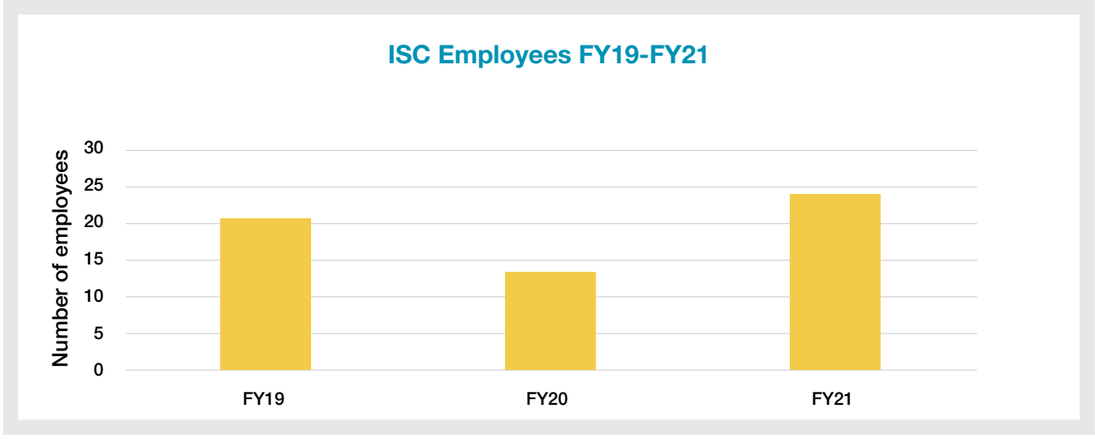
We have also been streamlining processes and upgrading our systems to improve stakeholder experiences, which has involved, not only the continuous improvement of the IS Rating Scheme, but also the commencement of our digital journey. We will continue this period of enhancement for the next two years.

ORGANISATIONAL HEALTH OBJECTIVE 2: PEOPLE AND CULTURE

Objective	What Success Will Look Like
Celebrate diversity, value well-being and together create change toward the United Nations Sustainable Development Goals	The ISC continues to be deeply and proudly driven by its purpose. It has an inclusive, high performing team who thrive in an ever-changing environment by always collaborating and supporting each other to perform at their best. The ISC team enjoys the challenge of their work, by being highly selective in choosing priorities, being accountable and supporting one another. There is a culture of listening to diverse views, encouraging robust open discussions, and there is a genuine appreciation and respect for the organisation's decision making processes and outcomes. ISC sets the standard for industry with a healthy and happy team, as measured by a dedicated key performance indicator.

We are committed to building the capability and capacity of our team to ensure that we can provide the highest level of support and leadership to the sector. The first half of FY21 was a consolidation phase. In the latter half of the year, we began to rebound. Intentionally looking to decentralise, with flexible working welcomed, we expanded our presence in Aotearoa New Zealand with 15% of the ISC whanau now resident there. Our highly engaged team share their feedback through our annual pulse and employee engagement surveys, with high performing and improving scores in almost every category.

	FY19	FY20	FY21
FTE employees	20.6	13.6	24

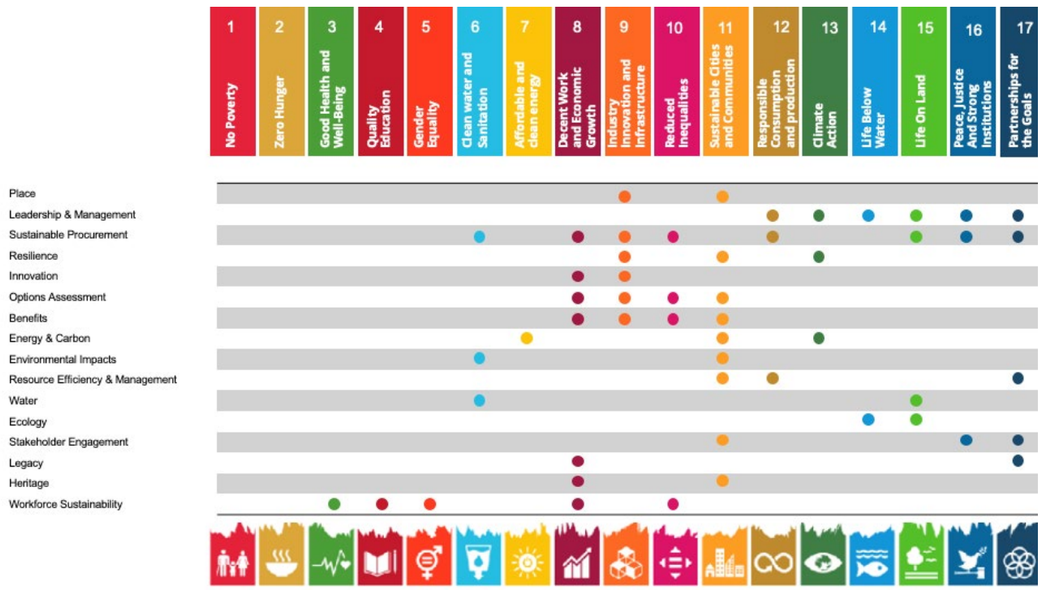


ORGANISATIONAL HEALTH OBJECTIVE 3: OUR IMPACT

Objective	What Success Will Look Like
Plan, implement and measure our impact and well-being as an organisation	The ISC tracks its impact towards the United Nations Sustainable Development Goals that its members have identified as critical to success. It has aligned its work output to these goals significantly, which increases its ability to deliver on these goals and to lead by example.

During FY21, the ISC progressed a number of significant plans about how we will directly deliver sustainable outcomes as an organisation, focused on four key elements:

- embedding the SDGs in our operational delivery – in particular, through the IS Rating Scheme (see ISv2.1 category alignment to the SDGs in the diagram below)
- becoming a Net Zero organisation by reducing our operational emissions as much as possible and offsetting the remainder – we are in the process of becoming a certified Net Zero organisation
- developing an SDG-driven sustainability plan (due FY22) - this will formalise and progress our direct action, such as our contributions to SDG 1 (No Poverty) and SDG 2 (Zero Hunger) through donating team gifts and charitable contributions to OzHarvest and KiwiHarvest , the donations we make on behalf of guest speakers at the ISC Connect Conference, our office and event sustainability and recycling practices, the diversity and inclusivity we support through choice of speakers and panellists at ISC events and other gender initiatives, such as our International Women's Day campaign (see box opposite)
- developing a draft Reconciliation Action Plan (due FY22) - as part of our drive to be a more impactful organisation, we undertook Indigenous Cultural Competency training focused on Aboriginal and Torres Strait Islander cultures, helping lay down the foundations needed for a sustained and successful contribution to the Traditional Custodians of the land now called Australia.



Alignment of ISv2.1 categories with the UN SDGs

International Women's Day

One of our core strategic imperatives as an organisation is to impact the UN SDGs, while another is to build capability for the sector. Opportunities and progression for women and equality across the sector are an important part of both those goals, improving a wider culture of inclusion for all. Diversity of experience and thinking can reduce group think and help deliver innovation, which we will need to address climate change and other pressing problems. The issue of making the sector attractive to women and retaining them within it has received even greater prominence with border closures reducing access to overseas sources of talent.

We generated a campaign for International Women's Day 2021 that had four parts:

- **Sound advice:** The path for our emerging leaders is critical as we look to build a more inclusive future. In the 2-week period leading up to International Women's Day, we shared 28 posts on social media using the hashtag #adviceto20yearoldself, sharing advice from a range of female leaders in the infrastructure sector on an insight they'd gained or some particularly sage advice they'd received, passing this forward to emerging leaders. We showcased a range of women across the sector of different career tenure and from different disciplines, backgrounds and geographies. Profiling women raised them up, debunking the proposition that there aren't many women in the sector. We also presented women earlier in their careers as successful.
- **Panel discussion:** Some of the insights shared by female leaders informed a trans-Tasman panel discussion on Challenging the Norms, exploring how we can all #domore to effect meaningful change through infrastructure. The panel included senior leaders from Aurecon, who co-sponsored the event, and Downer New Zealand, MinterEllisonRuddWatts and the Infrastructure Sustainability Council, who were panellists. Four of the five webinar participants were women.
- **ISC video:** A video was created from 13 tiles contributed by the ISC's own Board, senior leaders and wider team, which was shared on social media on International Women's Day.
- **Digital copies:** A range of high definition imagery was made available and displayed at International Women's Day events, further disseminating the underlying messages and stories showcased.

Overall, we raised the profile of 45 women and the #adviceto20yearoldself posts generated 1,772 Likes on LinkedIn. We created a platform to showcase real women within the sector, challenging outdated notions of women's capabilities and providing inspiration to our current generation of emerging leaders.





03 Pathways to Impact

Industry and Impact

Whether it is achieving climate action and resilience or a more inclusive and equitable society, we know that the big sustainability issues of our time are complex and cannot be solved by a single action or actor. They demand a collective, cumulative, systemic approach. In the previous section, through the lens of our strategic progress, we explored how the infrastructure industry is building capability and a collective culture of continuous improvement, aligning governance and investment and ensuring that environmental, social and economic outcomes are delivered through more assets across their whole lifecycle. This is essential to how we transform to a world-class infrastructure industry.

Inspired by 26 stories from our members about their achievements over the past year, we have identified thirteen common impact pathways. While not an exhaustive list, these pathways serve to illustrate how the industry really is working to create impact.

We introduce these 26 stories under four impact themes - Planet, People, Prosperity and Industry - examining how business outcomes could effectively contribute to the UN SDGs.

Each thematic section is prefaced by an overview of key issues, and we indicate for the identified impact pathways some example outcomes and their potential links to UN SDG targets.

The 26 stories include case studies from IS Rated assets, ISupply suppliers and ISC members. You will notice many different types of outcome; for example, an ISC ISupply listed supplier might be working on multiple IS Rated projects delivering a low carbon product, while creating an inclusive workforce and actively contributing to a responsible, agile supply chain.

While we have organised the case studies around these four impact themes, we recognise that every story describes multiple outcomes facilitating many potential pathways to impact, reflecting the systemic nature of the infrastructure industry.

Impact Themes		Impact Pathways
PLANET	*Taking climate action and protecting and regenerating our natural environment*	Low Carbon, Low Energy Economy
		Conserved Ecosystems
		Regenerated Landscape
		Circular Economy
PEOPLE	*Contributing to liveable communities with culture at their heart*	Liveable Communities
		Culture and Sense of Place
		Engaged People and Communities
PROSPERITY	*Creating inclusive, thriving communities and resilient economies*	Adaptive Capacity
		Measures of Socioeconomic Value
INDUSTRY	*Shaping a world-class industry and capable workforce aligned to sustainability*	Sustainability-aligned Governance
		Innovation and Knowledge Sharing
		Healthy, Inclusive Workforce
		Responsible, Agile Supply Chain

Case Study Impact Pathways

PLANET	**Transport for NSW:** Carbon Positive Car Parks	#Low carbon, low energy use economy #Adaptive capacity
	Arcadis: A Decarbonised World	#Low carbon, low energy use economy
	John Holland Group: Plains Grassland Conservation	#Conserved ecosystems #Innovation and knowledge sharing
	Transport And Main Roads Queensland: Pacific Motorway M1 Varsity Lakes to Tugun Upgrade	#Conserved ecosystems #Low carbon, low energy use economy #Circular economy
	Mott MacDonald: Regenerative Design	#Regenerated landscapes #Conserved ecosystems #Liveable communities
	Vital Chemical: Self-sustaining Revegetation	#Regenerated landscapes #Healthy, inclusive workforce #Liveable communities #Responsible, agile supply chain
	Huesker Australia: Passive Treatment of PFAS Contaminated Soil	#Regenerated landscapes #Liveable communities #Responsible, agile supply chain
	Pact Reuse: Recycled Plastic Noise Walls	#Circular economy #Liveable communities #Responsible, agile supply chain
	Paintback: A Circular Economy for Paint	#Circular economy #Responsible, agile supply chain
	McConnell Dowell Group: Creative Construction	#Circular economy #Conserved ecosystems #Responsible, agile supply chain
PEOPLE	**John Holland Group:** Giken Silent Piler	#Liveable communities #Conserved ecosystems
	METRONET: Tunnel Boring Machine Water Recycling	#Liveable communities #Circular economy
	SiteHive: Reducing Construction Noise, Dust, Vibration and Water	#Liveable communities #Healthy, inclusive workforce #Responsible, agile supply chain #Innovation and knowledge sharing
	HEB: Te Ahu A Turanga Manawatū Tararua Highway	#Culture and sense of place #Healthy, inclusive workforce #Conserved ecosystems #Engaged people and communities
	Watercare: Central Interceptor	#Culture and sense of place #Conserved ecosystems #Healthy, inclusive workforce #Engaged people and communities
PROSPERITY	**Transurban:** Study of Driver Behaviour During Extreme Weather	#Adaptive capacity #Sustainability-aligned governance
	Jacobs: Waratah and Wyee Stations Upgrade	#Adaptive capacity #Low carbon, low energy use economy #Innovation and knowledge sharing
	Main Roads Western Australia: Albany Ring Road	#Measures of socioeconomic value #Responsible, agile supply chain
INDUSTRY	**ANZ:** Sustainable Finance	#Sustainability-aligned governance
	Perspektiv: Sustainability Professionals	#Sustainability-aligned governance
	Autodesk: Impact Strategy	#Sustainability-aligned governance
	John Holland Group: Low Carbon Concrete Trials	#Innovation and knowledge sharing #Low carbon, low energy use economy
	Fibercon: eMesh Concrete Steel Mesh Replacement	#Innovation and knowledge sharing #Low carbon, low energy use economy #Healthy, inclusive workforce
	BlueScope Steel: ResponsibleSteel™ Standard and Certification Program=	#Responsible, agile supply chain #Sustainabilty-aligned governance
	Transport for NSW: Mindyarra Regional Rail Maintenance Centre	#Healthy, inclusive workforce #Low carbon, low energy use economy #Liveable communities
	CRL: City Rail Link Project	#Healthy, inclusive workforce #Circular economy #Engaged people and communities

Reviving a regenerative natural world

ISSUES

Climate change and nature loss are twin crises for humanity that are linked, occurring simultaneously and accelerating toward tipping points beyond which systems change will be irreversible. A key driver of both these crises is land use change. The UN estimates a US$4.1 trillion financing gap to meet targets on climate change, nature loss and land degradation[1]. The finance sector must work to shift trillions toward ventures that are aligned to these goals, while key sectors, including infrastructure, must devise portfolios, programs and projects to address human needs in ways that address and reverse negative climate, biodiversity and land use impacts. The circular economy is a key transition pathway and Net Zero is key threshold.

CLIMATE CHANGE

Our climate is 1.4C warmer in Australia and 1.1C warmer in Aotearoa New Zealand than in 1910. Our sea levels are rising faster than the global average, causing coastal flooding and sandy shoreline retreat. Snow cover is decreasing. The frequency of fire days has increased, the fire season is longer, and the intensity, frequency and duration of fire weather events is increasing. Rainfall, floods, marine heatwaves and marine acidity are all increasing, and sand and dust storms will increase in Australia[2]. We must adapt.

The infrastructure sector is highly climate impactful. Construction, operation and activities enabled by transport, energy, water, waste and communications infrastructures in Australia contribute to 15% directly and 55% indirectly of Australia's annual emissions – and these assets may still be in use in 2050[3]. Global pressure to act is expected to accelerate following the COP26 Climate Conference in Glasgow in November 2021, because global ability to limit warming to 1.5C is almost out of reach, and requires immediate, rapid, large-scale decarbonisation[4]. Current thinking in the infrastructure sector includes low carbon steel production; low carbon cement; renewable energy generation and storage; green hydrogen production and storage; replacing aged fleets with EV, biofuel or hydrogen vehicles; energy efficiency (including water efficiency); alternative urban forms; road pricing options; carbon capture and storage; and nature-based solutions. Some businesses have taken the important step of adopting a climate science-based target, which is a near term emissions reduction target that considers how much the business needs to abate to contribute effectively to limiting global warming to 1.5C.

NATURE LOSS

When ecosystems diminish, effects are local and systemic, leading scientists to predict that the human impact of the biodiversity crisis will be greater than from climate chaos. Loss of species variety and abundance has five drivers: land and sea use change, exploitation of species, climate change, pollution and invasive species[5]. Australia has the world's highest rate of mammalian extinction, with more than 1,700 species known to be threatened or at risk[6]. In Aotearoa New Zealand, wetlands have declined 90% since people arrived; 22% of terrestrial species, 17% of freshwater species and 32% of marine species are at risk[7]. New global goals for nature are expected to be ratified at the Convention on Biological Diversity COP 15 to be concluded in Kunming in April 2022. More than half of global GDP is nature-dependent, relying on ecosystem services, such as pollination, water purification and carbon sequestration. Science-based business targets that account for natural environment tolerances are increasingly important.

LAND USE CHANGE

Around 59% of Australia's landmass is used for agriculture, but this is slowly declining as climate change contracts food producing areas. There is an overall trend of land use intensification for residential, commercial and production purposes as the population grows and migrates toward coastal hinterlands and major cities in southern and eastern Australia[8]. Urban development is a major driver of nature loss (for instance, non-native invasive garden plants contribute to 72% of environmental weeds) and may be locking in climate vulnerabilities, such as development occurring in, and damaging, flood plains[9]. While half of total land area in Aotearoa New Zealand is used for agriculture, forestry and housing, with urban land covering just 1%, urban expansion is outwards onto productive land and areas of highly productive land being swallowed by development have increased 54% since 2002[10].

RESOURCE EXTRACTION AND WASTE

Global materials systems are 90% linear, leading to continued extraction, mounting waste and land use change[11]. In Australia, 17% of all waste (recycled and landfill) stems from construction activities and 27% of all waste goes to landfill. In Aotearoa New Zealand, 72% of all waste goes to landfill[12] and 33% of landfill stems from construction and demolition[13]. The infrastructure sector must become significantly more circular. Currently, approaches include life cycle analysis; efficient inventory management; lean construction; preventative maintenance; better sorting of waste streams; 3D printing; demolition and salvage strategies; and investment in new waste recycling facilities. However, we need to move urgently to next-generation circular design and waste elimination strategies.

PATHWAYS TO POSITIVE IMPACTS ON THE PLANET

Pathways to Impact	Example Outcomes	SDG Targets	
Low carbon, low energy use economy	✓ Use or generate renewable energy ✓ Minimise use of energy ✓ Reduce emissions as much as possible across the asset lifecycle ✓ Offset un-abatable emissions in ways that bundle positive climate, nature and social impacts ✓ Set and achieve science-based climate targets	7.1 Ensure universal access to affordable, reliable and modern energy services 7.2 Increase substantially the share of renewable energy in the global energy mix 7.3 Double the global rate of improvement in energy efficiency 12.c Rationalize inefficient fossil fuel subsidies that encourage wasteful consumption by removing market distortions 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	7 AFFORDABLE AND CLEAN ENERGY 12 RESPONSIBLE CONSUMPTION AND PRODUCTION 13 CLIMATE ACTION
Conserved ecosystems	✓ Reduce water use as much as possible across the asset lifecycle ✓ Improve downstream water bodies ✓ Protect and enhance ecosystems ✓ Avoid disturbing acid sulfate soils	6.3 Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals 6.6 Protect and restore water-related ecosystems 8.4 Improve global resource efficiency and endeavour to decouple economic growth from environmental degradation 14.1 Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities 14.3 Minimize and address the impacts of ocean acidification 15.4 Ensure conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and protect and prevent extinction of threatened species	6 CLEAN WATER AND SANITATION 8 DECENT WORK AND ECONOMIC GROWTH 14 LIFE BELOW WATER 15 LIFE ON LAND
Regenerated landscapes	✓ Reuse previously developed land ✓ Remediate contaminated land and manage contaminated material to eliminate risks to people ✓ Undertake ecological restoration projects that significantly improve ecological values	3.9 Substantially reduce deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 12.4 Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle 15.3 Combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods	3 GOOD HEALTH AND WELL-BEING 12 RESPONSIBLE CONSUMPTION AND PRODUCTION 15 LIFE ON LAND
Circular economy	✓ Create a resource strategy that targets zero waste and commits to sustainably certified products and supply chains ✓ Use products with strong materiality credentials ✓ Design-in adaptability and end-of-life disassembly ✓ Reduce lifecycle environmental and social impacts	9.4 Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes 12.2 Achieve sustainable management and efficient use of natural resources 12.5 Substantially reduce waste generation through prevention, reduction, recycling and reuse	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Transport for NSW:
Carbon positive car parks

#Low carbon, low energy use economy #Adaptive capacity

CARBON POSITIVE CAR PARKS OVER A 50-YEAR LIFE

These car parks have been designed to achieve a carbon positive outcome.

Leppington and Edmondson Park South car parks, delivered by AW Edwards, are two multi-story car parks in the Transport for NSW Commuter Car Park Program. These car parks have been designed to achieve a carbon positive outcome, considering whole of life emissions including construction activities, embodied emissions from materials and 50 years of operation.

Overall embodied carbon emissions will be reduced by an estimated 17%, equating to 3,802 tCO2e avoided. The remaining embodied carbon emissions will be more than offset through operational carbon emission savings over 50 years. The carbon positive approach adopted by these projects are projected to avoid 115,188 tCO2e over construction and 50 years operation.

Key operational initiatives to achieve this vision are:

- Highly efficient LED lighting with motion detection and daylight sensors for each fitting, significantly reducing operational lighting demand.
- Installation of electric vehicle charging stations servicing 10 car spaces at each car park, to encourage mode shift to low emission vehicles.
- A combined 1,370 kWp rooftop solar PV across both car parks, projected to produce at least 130% above annual operational energy requirements for both car parks.

The projects also feature future proofing through adaptable design and easy disassembly, as follows:

- The ground level has been designed so that it can be converted into commercial or retail space.
- The structural design allows for additional floors to be added in the future.
- The roof structure supporting the solar PV system has been designed to allow for disassembly and reinstallation if future expansion is required.
- Installation of cable route infrastructure for future electric vehicle chargers to service 15% of all car spaces.

Key design initiatives to reduce embodied carbon emissions include:

- A structural design to optimise and reduce concrete and reinforcing steel.
- Modified ramp design to enable increased provision of car spaces per total floor area, resulting in less material per car space.
- Concrete mix designs with an average of 37% recycled material to replace Portland cement.
- Procurement of reinforcing steel with an estimated 65-80% recycled scrap content and Environmental Product Declarations demonstrating lower embodied carbon.

Key resilience and climate change adaptation measures include:

- The rooftop solar structures provides refuge from direct sunlight and extreme temperatures with additional shade for commuters and parked cars.
- The ground floor of Leppington Car Park is raised above the 1% AEP flood zone, and the access points are outside the flood area to ensure the car park is operational during high rainfall events.
- Water-sensitive urban design features, such as a dual rainwater capture and on-site detention system. The on-site detention tanks filter stormwater from vehicle impurities and help to mitigate localised flooding. The rainwater compartments can store a combined 600kL, which will be reused to replace an estimated 30% of potable water demand.



Render of Edmondson Park South 'Carbon Positive' Car Park

PLANET

Arcadis: A decarbonised world

#Low carbon, low energy use economy

LEVERAGING OUR PRECINCT DEVELOPMENT OPPORTUNITIES

What we essentially have is a launchpad for the next generation of development.

In November 2020, Australia notched up a decade at the top of the global real estate sustainability ranking (GRESB). The intensive work that our commercial real estate investment trusts (REITs) have undertaken to transform the way in which we design, construct and operate our commercial property assets in Australia has placed us in good stead for a decarbonised future. Yet, the recently released Arcadis global study Supercharging Net Zero reinforces that we are losing the race to achieving a Net Zero economy in time to limit global warming to 1.5C. We need to think about what we need to do to drive toward a decarbonised world.

What we essentially have is a launchpad for the next generation of development and defining and capturing the opportunities that large scale infrastructure and precinct development offers will be critical. We know that we have access to the technologies, design thinking, construction methodologies and operational approaches that are needed to develop in a decarbonised way. What we need to do from here is harness those opportunities to ensure that each mark that we make on our cities is one that will lead to a decarbonised world.

In Melbourne, Brisbane and Sydney today, we are designing precincts that will not come to full fruition for decades. For each of those precincts, there exists the opportunity to design in the needs of the future – or not. For each of those precincts we will make thousands of decisions and each one has the potential to optimise the carbon potential.

A precinct is a complex beast. A microcosm of the city around it. Many stakeholders will help form its potential. How then do we ensure that the precincts that we design today will optimise our decarbonised lives? Will we be able to harness the interconnected elements that form a thriving community within a precinct, and leverage the interdependencies for our decarbonised good?

We believe that we can. Just as the REIT's have seized the opportunity to change the way in which they design, construct and operate their portfolios, we now have the opportunity to design decarbonised precincts. In doing so we will harness the opportunity to normalise what it is to live in a decarbonised city and a decarbonised world.

With each of the major rail projects in our cities, comes new stations with precincts around them, designed to optimise these infrastructure investments. With public transport at their heart and prime development opportunities around them, how we generate energy in those precincts; how we design, develop and construct; how we encourage movement around them; how we accommodate people and the needs of their lives, how we light them and mitigate the production of waste; how we produce food; how we think about the microclimates that we are creating – how we create places for people, will heavily determine how effectively we decarbonise.

With projects like Suburban Rail Loop in Melbourne, Cross River Rail in Brisbane, Western Sydney Airport Metro and many more, we have the opportunity to create the precincts of the future where life will be richer for a decarbonised approach. So, while our global research clearly defines the challenge we are facing, the opportunities and the evidence of just how far we have come fuels our belief that if we invest in our future precincts well, we can turn the tide.



John Holland Group: Plains grassland conservation

Infrastructure Sustainability Rating

#Conserved ecosystems #Innovation and knowledge sharing



Biosite 3525, Sunbury

ECOLOGICAL ENHANCEMENT

A positive ecological net-gain without the need for ecological offsetting.

Native grasslands, known as Plains Grassland Ecological Vegetation Class (EVC), are endemic to south-western Victoria and primarily confined to the Victorian Volcanic Plain bioregion. Prior to European settlement, this community was widespread and extended from Greater Melbourne to Hamilton in the west of the state. Due to the cumulative impact of European settlement (pastoralism), land clearance, agricultural intensification, and urban development, as little as 2% of this formerly widespread ecological community remains (Barlow & Ross, 2001). Today, these native grasslands are threatened at both the Commonwealth and State level – where present, they are listed as Critically Endangered under Commonwealth legislation and listed under Victorian legislation.

Key to the ongoing preservation of this threatened ecological community is the protection of high-quality examples of the community where they remain. These examples often exist as small, fragmented remnants within public land road reserves, rail reserves and cemeteries (Stuwe, 1986). The increasing awareness of the conservation value of these high-quality remnants within Melbourne's urban growth corridor has increased in recent times, placing

greater emphasis on the protection and restoration of these sites. Land on which the Sunbury Line corridor was built once supported vast areas of native grassland and examples of these high-quality remnants remain today where they are protected within Biosites. These Biosites not only protect examples of the threatened ecological community but also provide habitat for several flora and fauna species that are also threatened at the Commonwealth and State level.

The Rail Infrastructure Alliance (RIA) comprised of John Holland Group, CPB Contractors, Metro Trains Melbourne, AECOM and Rail Projects Victoria have delivered the Metro Tunnel Project and Sunbury Line Upgrade Project, which aim to achieve a positive ecological net-gain without the need for ecological offsetting. The approach to the delivery of the projects has achieved this by ensuring that no native vegetation was removed to facilitate the works and high-value ecological sites have been maintained, protected and enhanced.

This was delivered in two key stages.

Stage 1 – Ecological Impact Assessment (EcIA). This involved the development of an innovative method to select appropriate sites for enhancement, assessing both the ecological value and habitat connectivity value of the assets within the rail corridor, as well as providing a method to rank each site for their enhancement potential. The EcIA method drew upon existing scientific and widely accepted practices for the assessment of native vegetation as required by State legislation for the characterisation of ecological value. Building from this, the novel method developed by RIA ecologists then also considered how best to prioritise each of the sites for enhancement. Overall, the process allowed for RIA to consider the best locations for ecological enhancement, factoring in both ecological value and habitat connectivity, with respect to the wider strategic context for native grassland conservation within Melbourne's urban growth area. This meant that RIA could select sites to enhance that would provide the greatest contribution to grassland conservation in terms of quality, connectivity, and longevity. The methodology of the EcIA is new and has previously not been used on any other Project in Australia. There is potential for this methodology to be adopted for other rail or linear infrastructure projects in the future.

Stage 2 – Delivering Ecological Enhancement. Once preferred sites were identified, RIA engaged with key stakeholders to pursue ecological enhancement opportunities. Through consultation with a range of landowners and land managers, sites were selected for enhancement. A total of five sites were selected along the Sunbury Rail Corridor, which are managed by Metro Trains Melbourne (MTM). By enhancing five ecological sites, RIA is able to deliver 3.04 hectares of additional native grassland within the rail corridor which contributes significantly to both the extent of the native grassland community within the rail corridor and the connectivity between these areas of ecological value. This equates to greater than 30% enhancement of the ecological value that exists within the RIA project land. RIA ecologists developed an Ecological Enhancement Management Plan (EEMP) in collaboration with MTM and their biosite managers to develop a bespoke ecological enhancement program that provides the greatest certainty of success. Collaboration with biosite managers ensured that the proposed EEMP built upon the existing management actions for each of the site and considered the existing ground conditions from the biosite managers.

This approach contributes to a long-lasting ecological contribution to the region, leaving a positive legacy of a net-gain for ecology and a potential precedent for other rail or linear infrastructure projects.



Transport and Main Roads Queensland: Pacific Motorway M1 Varsity Lakes to Tugun upgrade

Infrastructure Sustainability Rating

IS Design LEADING

#Conserved ecosystems #Circuler economy #Low carbon, low energy use economy

PLANET

INNOVATIVE, SUSTAINABLE SOLUTIONS FOR COMPLEX TRANSPORT NEEDS

Sensitive flora, fauna and aquatic areas of the Gold Coast motivated TMR to reduce its environmental footprint and promote positive change at every opportunity.

The Pacific Motorway (M1) is a vital transport link between Queensland and the southern states, carrying interstate freight, tourist and commuter traffic. The section between Varsity Lakes (Exit 85) and Tugun (Exit 95) currently carries about 90,000 vehicles per day and is frequently congested during both weekday and weekend peak periods. Traffic demand for this section is growing and by 2026 is expected to exceed 100,000 vehicles each day. Now in construction, the Varsity Lakes to Tugun (VL2T) upgrade is a city-shaping project for the southern Gold Coast and forms part of the wider Pacific Motorway M1 upgrade program aimed at improving safety and reducing congestion along one of Australia's busiest highways. The VL2T upgrade will widen 10km of the M1 and is being built in three packages to ensure faster delivery and best value for money.

VL2T's Commitment to Sustainability

From the outset, Queensland's Department of Transport and Main Roads (TMR) has been committed to managing the design and delivery of the VL2T upgrade in a way that drives environmental, social and economic outcomes and supports an ecologically sustainable infrastructure development. Each package of works is targeting an IS Rating (v1.2) of 'Excellent' or above, which represents going beyond a business-as-usual approach and delivering best practice. The individual package rating will then contribute to the overarching VL2T program rating.

Before construction, several investigations and assessments were carried out to ensure there was a robust understanding of the environmental and cultural significance in and adjacent to the project area. Burleigh and Tallebudgera were identified as sensitive flora, fauna and aquatic areas of the Gold Coast, which motivated TMR to reduce its environmental footprint and promote positive change at every opportunity.

IS Design Rating

At completion of the design phase, the VL2T upgrade was announced as the first ISv1.2 Road Program to secure a 'Leading' Design rating and the first ISv1.2 Program in Queensland to receive a 'Leading' Design rating. To achieve this, the design specifications across the three packages incorporated several environmental sustainability performance requirements, which will be realised as part of the VL2T delivery. These include significant terrestrial and aquatic enhancements, a considerable reduction in waste and an increase of sustainable material usage, as well as verified Australian and Queensland-first innovations. It is acknowledged this achievement has been the result of valuable stakeholder input, internal and external to the project, including community participation and consultation, leadership and openness to trying new things, collaboration and extensive knowledge sharing between TMR and its design consultants.

Ecological Enhancements

As part of a 'Green Thread' vision under VL2T's Urban and Landscape Design Strategy, extensive landscaping treatments will be applied, with more than 570,000 native shrubs and trees of various sizes and more than 4,700 (or five hectares) of koala habitat tree plantings being planted along the corridor. A 15m-wide fauna underpass will be built to connect the Burleigh to Springbrook bioregional wildlife corridor, and offset planting of protected tree species has already started. Other ecological enhancements include improved fish passage, habitat and riparian areas and the rehabilitation of Jack Ross Memorial Park and restoration of Oyster Creek.

Reduced Waste

An average 24% reduction in embodied carbon and GHG emissions has been achieved through the following initiatives:

- retention of existing structures and combined fencing solutions
- two concrete pavement fracturing techniques known as ‘rubblisation’ and ‘crack and seat’
- recycled macro synthetic fibres for reinforcing concrete (in place of steel)
- increased proportions of Supplementary Cementitious Materials (SCM) in concrete (reducing the use of traditional Portland cement content)
- Stone Mastic Asphalt (as opposed to open-graded asphalt) offering improved structural pavement strength and increased maintenance life
- EME2 asphalt (as opposed to traditional AC20 asphalt) requiring reducing pavement thickness, resulting in less material and construction time.

Australian and Queensland-first Innovations

In an Australian first, the project team has developed invertebrate sensitive road design strategies by prioritising the planting of host plants and food species to reintroduce threatened butterfly populations – the vulnerable Richmond Birdwing and rare Swordgrass Brown butterflies.

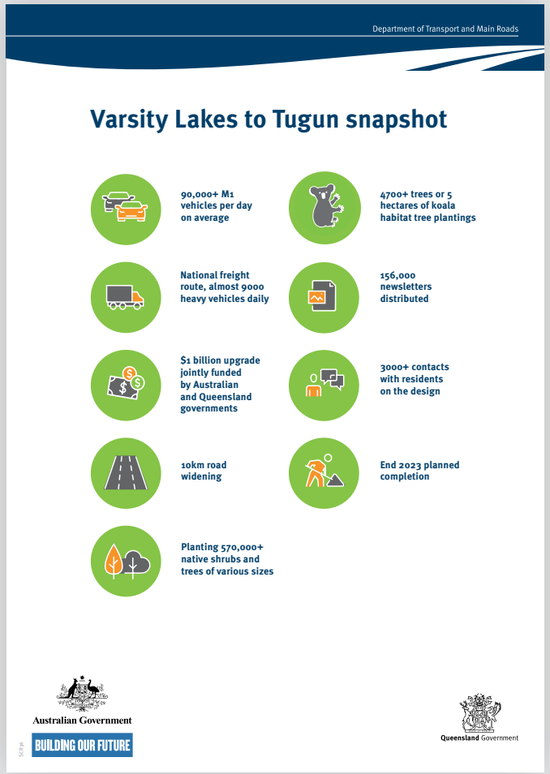
In collaboration with key environmental organisations, the project team has achieved another Australian-first by designing a fauna-shield protection device to prevent animal strikes occurring along the M1 motorway. This design involves modified precast noise barriers which is a cost-effective solution as it removes the requirement for additional fauna fencing to be installed and will require little maintenance over the lifecycle of the asset. TMR has added this innovation to its Fauna Sensitive Road Design Manual 2021/22.

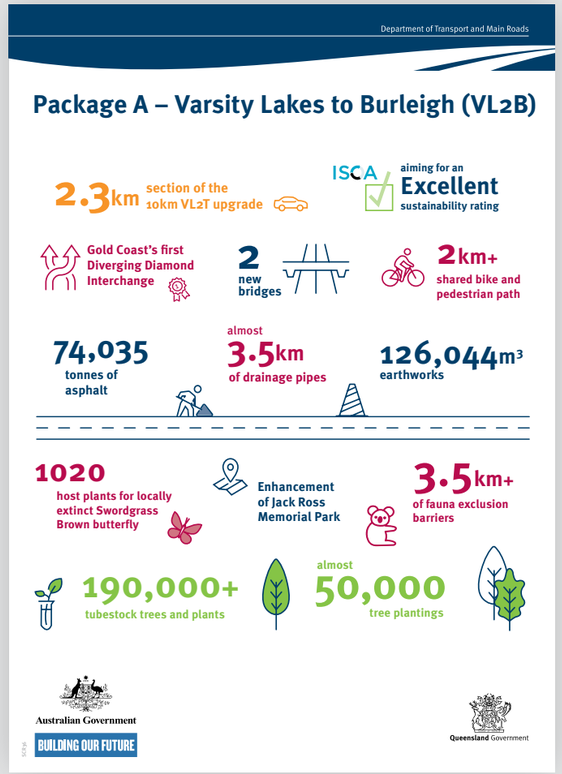
Utilisation of an Australian-first, concrete-fracturing technique, known as ‘rubblisation’ – a process that involves cracking the existing concrete pavement in-situ and using the material as subgrade under the new motorway. This technique removes the need for off-site disposal and recycling and allows the new pavement to be built on the newly rubblised layers. Sustainability benefits include reduction in waste, materials, transport, energy (less construction time) and water with lower overall carbon impacts.

In a Queensland first, TMR has developed a waste and recycling calculator designed to trigger and drive market transformation in the transport infrastructure sector. The development of this calculator enables waste estimates to be made before construction, while providing consistent data to be captured during construction (including actual waste and recycled material quantities) allowing for more accurate pre-construction waste estimates for future projects.

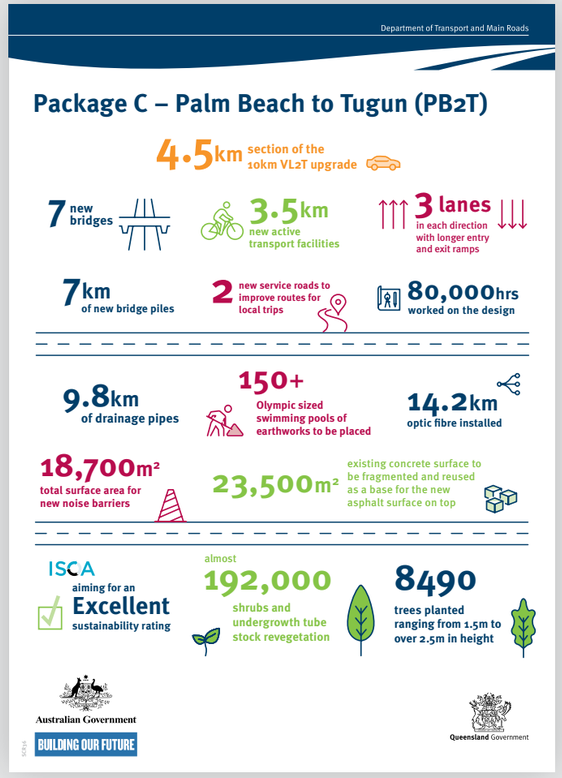
Moving Forward

As work progresses on this major infrastructure upgrade, the outcomes and lessons learnt from implementing ISv1.2 on this project are being integrated into TMR’s BAU practice. TMR and its contractors remain committed to working towards an IS Program Rating of ‘Excellent’ or above while displaying a high standard of practice to inspire the next generation of road designers and builders to continue creating sustainable projects like VL2T.









Mott Macdonald:
Regenerative design

#Regenerated landscapes #Conserved ecosystems #Liveable communities

THE POWER OF POSITIVE OUTCOMES THROUGH REGENERATIVE DESIGN

We are opening the opportunity for the destruction of 75% of Australia's biodiversity over the past 100 years to be regenerated and restored.

For the last 100 or so years we have been intent upon using nature and its resources for our needs with little care or concern for the wellbeing of the living systems on which we depend. Climate change has finally got the world's attention, but to meaningfully address it we will need to move beyond reducing carbon and look more deeply at our relationship with the natural world. We will need to address the societal and economic values that are based on a 'take, make, waste' society and start to develop a different set of values that are based on the knowledge that if other living systems on earth are thriving, then we will thrive as well.

Regenerative Design is a whole systems design approach that helps us on this path and aims to regenerate ecosystems and communities by harmonizing human activities with nature. It is a process that leads us to solutions that address climate change and biodiversity loss together and moves us past business-as-usual incrementalism, where we seek to reduce the harm we are causing, towards questioning why we are causing harm in the first place.

We have been working with several clients across infrastructure, transport and buildings to bring a Regenerative Design Framework to the table that can be integrated with their existing sustainability plans or visions and help to evolve them towards creating positive outcomes for climate, ecology and community.

The process builds upon six regenerative principles that underly all goals and outcomes;

- Place-based solutions that are unique to the specific living systems of that place
- Whole systems design that looks at all aspects of the project in an integrated way rather than separately
- Self-evolving, recognizing that eco-systems and communities continuously evolve through time
- Abundance: Creating new potential that would not have been considered otherwise
- Eco-centric rather than anthropocentric
- Co-design between nature, people, and communities

Our work on regenerative design is outcomes focused, moving us from the typical sustainability outcomes that we might see in sustainability plans, such as 'water efficiency' to an outcome like 'contribute positively to the watershed'. Another key part of regenerative design is empowering the design and engineering teams to stretch beyond the normal bounds of sustainability into innovation through looking at how the project can create positive outcomes and resilience for the future. Projects we are working on have begun their regenerative design journey through making space for nature, introducing living and green infrastructure, and regenerating eco-systems that were discarded or abandoned from past industrial uses. We are looking beyond the boundaries of the projects and are examining the opportunity for nature-based solutions to bring climate solutions to the table that also brings new potential for positive community outcomes.

Together with embedding an Aboriginal-led Connecting to Country framework into a project, regenerative design ensures that the large-scale infrastructure projects that we build and plan for are taking care of Country. We are opening the opportunity for the destruction of 75% of Australia's biodiversity over the past 100 years to be regenerated and restored so that we are resilient for the future and can lay the path for circular economies to be realised.



Vital Chemical:
Self-sustaining revegetation

#Regenerated landscapes #Liveable communities
#Healthy, inclusive workforce #Responsible, agile supply chain

VE GRO-MATT

Delivers immediate environmental benefits, minimising the impacts of infrastructure development and enabling the regeneration and enhancement of ecosystems.

Vital Chemical strives to achieve industry best practice for the environmental efficacy of our products. Our operating procedures are managed in a way that not only mitigates environmental impact but focuses on preserving and restoring the environment. As an Australian owned and operated manufacturer, we are extremely proud of our contribution to the local economy and the long-term positive environmental outcomes for the communities in which we operate. Our commitment to sustainability goes beyond mitigating negative environmental impacts. Vital Chemical has taken positive action to align our manufacturing processes toward environmental efficacy, ensuring that our operations support the long-term expectations and outcomes of our stakeholders.

Procuring Vital Chemical products support industry sustainability through:

- Sourcing raw materials sustainably and ethically
- Prioritising local industry participation
- Our commitment to social procurement initiatives
- Avoiding modern slavery
- Prioritising indigenous engagement

VE Gro-Matt on the CR2SM project

The Caloundra Road to Sunshine Motorway (CR2SM) project is a prime example of Vital products supporting sustainable development. VE Gro-Matt was employed to deliver immediate environmental benefits, minimising the impacts of infrastructure development and enabling the regeneration and enhancement of ecosystems. As Queensland's largest road infrastructure project with an intrinsic sustainability focus, there were stringent criteria around the erosion control works, incorporating more than 1,000,000 metres squared of a self-sustaining revegetation solution with clear requirements to support the establishment and sustainable growth of a specified blend of native seed species.



VE Gro-Matt being applied at the CR2SM project in Queensland

Following a robust selection process, VE Gro-Matt was chosen as the revegetation solution on the CR2SM project. Manufactured in Queensland from recycled and sustainably sourced Australian waste timbers, VE Gro-Matt provided ideal growing conditions, resulting in the delivery of immediate stabilisation, whilst establishing a sustainable growth medium.

VE Gro-Matt has exhibited key contributions to the environment and society in areas such as sustainable procurement, energy and carbon, resource reuse, green infrastructure plan, environmental impacts, water, ecology, workforce sustainability and legacy.

- Manufactured in Queensland.
- Resource recovery from historic waste streams.
- Unique water holding capabilities improving soil moisture levels.
- Significantly reduced water use.
- Providing ideal growing conditions resulting in the delivery of immediate stabilisation.
- Establishing a sustainable growth medium.
- Increasing biodiversity and native plant establishment rates using broad acre application methodologies
- Immediate stabilisation to reduce impacts to receiving environments
- Minimising rain impact erosion and sediment generation.
- Eliminating fugitive dust emissions.

Huesker Australia:
Passive treatment of PFAS contaminated soil

#Regenerated landscapes #Liveable communities #Responsible, agile supply chain



Tektoseal Active PFAS

TEKTOSEAL ACTIVE PFAS GEOCOMPOSITE CONTAMINATED SOIL

Modern society needs to isolate and remediate sites contaminated with 'forever chemicals' that do not biodegrade and cause long term health issues in humans and animals.

Huesker GmbH was founded as the limited partnership H. & J. Huesker & Co in December 1861 in Germany. For over 150 years, the company has produced geotextiles and other materials for the civil engineering, construction, mine, environmental and other industries. Huesker is the oldest and one of the largest global suppliers of these materials with a long history of successful innovation and materials development.

A recent need that has come to the forefront of modern society is the need to isolate and remediate sites with the chemical contaminate broadly identified as PFAS (Per- and polyfluoroalkyl substances). These chemicals, when used properly, can provide important functions, but they have been used without what is now understood to be proper care and stewardship. PFAS contaminates our environment. Called the 'forever chemicals', they do not biodegrade and cause long term health issues in humans and animals. There is a need to both remediate PFAS contamination and to provide containment of existing spills and emissions.

Huesker has created a line of products designed to both absorb PFAS type chemicals and to act as a component of barrier systems for capping, soil isolation, groundwater protection and other applications. The Huesker materials have demonstrated, in rigorous laboratory testing, the ability to absorb significant quantities of PFASs and to retain the collected contamination even under conditions and circumstances that cause other products to re-release PFASs to the environment. This function is urgently needed by geotechnical engineers and scientists who are working on site containment and remediation.

By providing materials suitable and designed to contain PFASs, Huesker offers a valuable tool to protect human health, improve the environment and cease or dramatically reduce the spread of PFASs from severely contaminated sites, such as airports, fire training centres and manufacturing sites. This allows for rejuvenation of these sites, permits existing infrastructure to be used in safe conditions and helps Australian citizens to adapt to community issues.

Differently from other solutions, this material is capable of remediating contaminated soils, eliminating transport and disposal costs and the risk of contamination of new areas. Furthermore, the remediated soil can be used as valuable asset and not, anymore, as harmful waste.

Infrastructure Sustainability Rating

Pact Reuse:
Recycled plastic noise walls

#Circular economy #Liveable communities #Responsible, agile supply chain

A WORLD FIRST IN NOISE WALLS

A world first, both in terms of the amount of recycled material used and the type of plastic recovered.

Noise walls made from 75% post-consumer recycled milk bottle-grade HDPE and soft plastics have been installed on the Mordialloc Bypass project, Victoria, in a world first, both in terms of the amount of recycled material used and the type of plastic recovered.

Our innovation journey

Pact Reuse (formerly Viscount Rotational Mouldings) have been developing a product made with recycled content for years, initially to use on our own site to shelter from the noise of machines. Thanks to the broader Pact Group's business structure, we have been able to offer products with recycled content to the market for several years, where there was no interest before.

In this encouraging environment of innovation, we worked hard to develop an even more advanced product. We looked at our own business and thought about the immense amount of stretch wrap and soft plastic that is used and disposed of in manufacturing. We thought, surely, we can put it to good use.

Thus came the latest iteration of our product. In addition to more easily recycled milk bottle-grade high density polyethylene (HDPE), we were able to incorporate recycled soft plastics into the mix, finally finding a sink for a very hard to recycle material that no longer needs to end up in Australian landfills. We were also able increase the recycled content of our product by up to 80%, of which half is milk bottle-grade HDPE and half is soft plastics. All is post-consumer recovered.

The product has now been widely accepted in technical specifications across the country and overseas, and the business has invested heavily in third party testing and product validation.

First project for our new product

The Mordialloc Bypass project is the first project to use the new product. Situated along Mordialloc Freeway, the walls transform around 570 tonnes of hard-to-recycle plastic materials into panels spanning 32,000 square metres. Thanks to the advocacy, support and proactive thinking of the State Government, the IS Council, Ecologiq (a Victorian Government initiative to optimise the use of recycled and reused materials across Victoria's Big Build projects) and Major Road Projects Victoria, recycled material and the environmental problem it addresses now have a forum and have become a current priority discussion.



Recycled plastic noise walls, Mordialloc Bypass

Learnings to share

It has been an amazing journey and we can share some learnings:

- Sourcing soft plastics was challenging as there is no other demand for them, and they hadn't been used in this space before. We have set a precedent and procurement will be smoother in future projects.
- As we have always invested in testing and product stewardship, we had a great reception from academia and the industry.
- Early approvals and letters of intent can help us get approval in advance, mitigating risk. It can also favourably impact the sourcing of raw materials.
- We are contributing to the conversation around the benefits of recycled material.
- Early access to projects means architecture and design teams can take advantage of the possibilities the product offers, rather than adapting a previous design.
- Being in the position of pioneering in this space, we have been able to cooperate with the State Government in developing new specifications for the product.
- What we've learned about operational efficiency, equipment process and materials has catalysed further internal development and investment in this space.

Paintback: A circular economy for paint

#Circular economy #Responsible, agile supply chain

RESEARCH MISSION EYES HUMBLE HOUSEHOLD PAINT AS OUR CIRCULAR ECONOMY HERO

We want household paint to become a showcase for the circular economy.

The humble household paint is at the heart of an Australian research mission to divert 90% of Australia's unwanted paint out of landfill and vital waterways and into the country's budding circular economy. From trialling paint products in pedestrian footpaths to research testing paint ingredients for a new type of concrete, national paint recovery scheme Paintback and alliances of Australian scientists and engineers are on the hunt for new ways to kickstart a circular economy for paint.

Paintback is the official product stewardship program for Australian paint, which is supported by paint manufacturers and funded by a 15c-per-litre levy on eligible paint products. We eventually aim to recover 90% of unwanted paint and packaging and transform them for use in Australia's circular economy – where products are re-used or repurposed for other manufacturing or industry processes to keep them circulating instead of being discarded permanently.

Paint already contributes to a circular economy by conserving and refurbishing a vast array of buildings and assets, but we are investigating new ways of putting unwanted paint into circulation and creating new markets for Australia's unwanted paint. We want household paint to become a showcase for the circular economy.

To do this, Paintback has begun an ambitious five-pronged research and development program to kickstart the hunt for new ways to use unwanted paint and packaging in Australia. Our research program is guided by our R&D advisory committee, chaired by aerospace engineer Prof. Murray Scott, chemist and former Victorian Lead Scientist Dr. Leonie Walsh, R&D and paint industry specialist Roy Rose, waste and environmental specialist Cheryl Batagol PSM and Paintback Chief Executive Karen Gomez. The research program involves separate partnerships with the ARC Industrial Transformation Research Hub for Transformation of Reclaimed Waste Resources to Engineering Materials and Solutions for a Circular Economy, the Smartcrete Co-operative Research Centre, the Australian Road Research Board and Pact Group's Astron Sustainability.

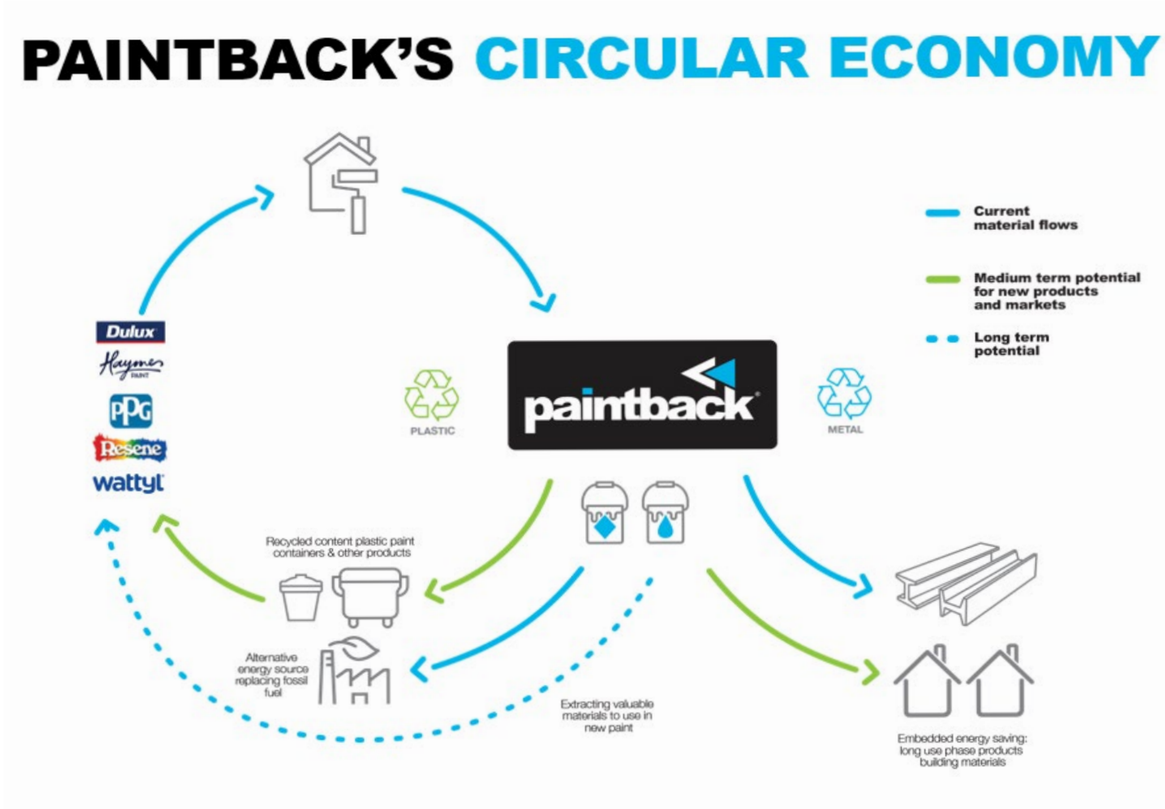
Research includes investigating:

- Turning plastic paint pails into cleaned and shredded plastic to produce new paint pails, reducing the reliance on virgin material. The manufacturing process has been tested and it is hoped they will go into production in Melbourne this year.
- Paint is a candidate to make geopolymer concrete – a type of concrete that is made of industrial waste and processed at room temperature. This would significantly reduce the greenhouse gas emissions associated with the production of other cements, which is processed at temperatures over 1400°C.
- How paint ingredients might replace some of the chemicals currently used in road construction products.
- The use of paint to replace admixtures in concrete.
- Proof-of-concept research to combine plastic from recovered pails with other waste streams such as glass, carbon, and natural fibres to produce high-performance composites for the construction industry.

Last year alone, Australians returned 8.1 million kg of paint and pails to Paintback, which runs over 165 permanent collection sites across the country to collect the paint and ensure it is disposed of safely or converted for other uses. Currently, that includes as an alternative fuel for kilns and extracting water from latex paint to be used in industry. Australians have returned more than 30 million kilograms of unwanted paint and packaging since Paintback started five years ago.

Yet Paintback research shows that while one in three Australians have old or leftover paint at home, more than half (54%) don't know there are organisations to help them dispose of paint safely. This is an issue since it has been estimated that up to 5% of paint purchased each year ends up surplus to requirements.

'If we can make Australia's unwanted paint a hero of our circular economy, we help protect the environment, reduce the amount of paint in landfill and support local innovation', says Paintback Chief Executive Karen Gomez.





McConnell Dowell Group: Creative construction

#Circular economy #Conserved ecosystems
#Responsible, agile supply chain

Infrastructure Sustainability Rating
Design EXCELLENT
As Built LEADING

CREATIVE CONSTRUCTION FOR A CIRCULAR ECONOMY AND ECOLOGICAL OUTCOMES

Engagement with the supply chain have led to innovations that push the wider construction industry towards positive outcomes.

Core to McConnell Dowell's values is Creative Construction, which has allowed us to embrace circular economy principles. As part of each project's planning phase, opportunities are considered to maximise reuse of materials and use of recycled content into temporary and permanent works. This has resulted in engagement with the supply chain, leading to innovations that push the wider construction industry towards positive outcomes. Also, toward our purpose to Provide a Better Life, we consider ecological systems in the communities where we work.

Recycled plastics in construction

Maximising recycled content in asphalt: Regency Road to Pym Street Road was the first infrastructure project in South Australia to apply soft plastics in asphalt on an arterial road. We worked with suppliers to utilise a 100% recycled asphalt, ReconophaltTM, for a temporary carpark. To ensure that the sustainability benefits of asphalt mix containing recycled soft plastics were better understood, an Environmental Product Declaration (EPD) was developed. The R2P Alliance (McConnell Dowell, Mott MacDonald, Arup and the Department for Infrastructure and Transport (Government of South Australia)) worked with Downer and Green Industries South Australia to identify and obtain suitable funding under the Circular Economy Market Development program to assist with the development of the EPD. Both the EPD and its inclusion in the ISC materials calculator, will allow ReconophaltTM to be compared to a range of existing generic (and, in time, specific) asphalt types already present in the Materials Calculator. This EPD for asphalt was verified by ISC as a first initiative of its kind in Australia.

Recycled composite sleepers: The Wyndham Vale Stabling project was constructed for V/Line by the Western Program Alliance, comprising McConnell Dowell, Mott MacDonald, Arup, MTM, V/Line and the Level Crossing Removal Project. In a dedicated trial area, low profile concrete sleepers proposed for the sidings were substituted with recycled plastic composite Duratrack® sleepers. This substitution was significant as it was the first time in Australia that recycled plastic sleepers were substituted for concrete sleepers. The driver for the innovation was to improve the sustainability footprint of the project, as approximately 4 tonnes of plastic have been recycled and saved from the landfill for this trial. Sustainability benefits include equivalent design life, fully recyclable at the end of the asset life and reduced carbon emissions from manufacture and transport distances. These recycled plastic sleepers are now Type Approved, providing for the opportunity for them to be used in future works for V/Line and confidence for other rail operating authorities to adopt.

Recycled plastic noise walls: On the Mordialloc Freeway project (McConnell Dowell and Decmil JV for Major Road Projects Victoria), we used 32,000 square metres of noise walls made from more than 570 tonnes of plastic waste. The panels comprise 75% recycled plastic, the highest percentage ever for an Australian road, which was sourced from household waste HDPE plastics (eg milk and soft drink bottles) and soft plastics that are notoriously difficult to recycle (eg food wrappers and bubble wrap). They were manufactured in Carrum Downs by PACT Group, helping them retain local jobs. Exemplifying the principles of the Victorian Government Recycled First policy, the panels meet traffic noise reduction requirements but also have a lifecycle in excess of 40 years and can be recycled at the end of their life; they are less than half the weight of steel, making installation easier; and they are non-porous, so paint and graffiti can't be absorbed into them.

Community ecological systems

Ecologists worked closely with the design team on the Mordialloc Freeway project to develop design features that increase habitat connectivity, despite freeway infrastructure being constructed and native vegetation being removed. Fauna crossing (wet and dry cells) culverts increase the ability and likelihood of fauna movement and dispersal through the project area. Landscaping features indigenous plants that align with the area's associated Ecological Vegetation



ReconophaltTM 100% recycled asphalt on the Regency Road to Pym project

Class, as well as being sympathetic to fauna species such as frogs by providing habitat, protection and easier movement through the corridors. Logs and fauna furniture also result in more habitat for native fauna species in the area.

Connectivity for flying species was considered on other projects. On the Regency Road to Pym Street project, constructing native gardens has provided a food source for native butterflies in an urban area where suitable habitat for wildlife is under pressure, and leaves a lasting legacy. In conjunction, a biodiversity awareness program was rolled out to local community group and schools that specifically included awareness on native butterflies and the planting of butterfly gardens to further increase suitable habitat in an urban area, in the vicinity of the project.

On the Echuca Moama Bridge project (McConnell Dowell for Major Road Projects Victoria), provisions have been made for several squirrel gliders to traverse the road corridor aerially to minimise ground level crossing attempts and potential fatalities from traffic impacts. The designs were created under the recommendations and advice of one of the foremost glider experts in Australia. Additionally, wood from the removal of Large Old Trees (LOTs) in the project area was repurposed to create fauna hollows.

PEOPLE

Creating thriving nations & valuing our cultures

We want to enable wellbeing for current and future generations and ensure that our culture and our richness of worldviews are placed and maintained at the heart of decision making.

ISSUES

POPULATION GROWTH

Populations are set to grow and age. Australia could grow from nearly 25 million today to between 37 million and 49 million by 2066[14], while Aotearoa New Zealand's 'team of 5 million' could reach 6 million by 2050. Some regions and urban centres will expand, while other, mostly rural regions, may diminish[15]. The current median age of Australians and New Zealanders will increase from around 37 years today to between 39 and 43 years for Australians by 2066[16] and as much as 47 years for New Zealanders by 2073[17], potentially changing demand for health, travel-related and leisure infrastructures.

INDIGENOUS WORLDVIEWS

Indigenous cultures and worldviews are poorly understood and undervalued. Major threats to Indigenous ways of life include natural resources extraction, large scale agriculture, infrastructural development and conservation development. Changes to culture, ways of life and sense of place can lead to anxiety and opposition to infrastructure projects.

Aboriginal and Torres Strait Islander people continue to face challenges to their identity as Indigenous Australians despite a connection to the land that stretches back at least 65,000 years. Places of meaning and significance to Indigenous Australian people include places associated with Dreaming stories, places associated with their spirituality, places where other cultures came into contact with Indigenous Australian people and other places with contemporary significance. The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 and the Protection of Movable Cultural Heritage Act 1986 exist to protect Indigenous heritage[18]. Infamously, however, a 46,000-year old sacred site was legally destroyed to expand a mine, and permits to destroy sacred trees, rocks and other sites for development are routinely issued. Sacred sites also suffer from invasive tourism, with Uluru closed to climbers only in 2019. Other threats to Indigenous Australian culture and places include mining waste, such as uranium, leaking into water systems, compulsory land acquisition, invasive species, sea level rise and the destructive effects of bush fires on rare ecologies, endemic species and sacred sites.

Te Tiriti o Waitangi, the Treaty of Waitangi, is a founding document in Aotearoa New Zealand, written in two languages that are not exact translations of each other, with much potential for misunderstanding. The Waitangi Tribunal was founded in 1976 as a permanent commission of inquiry to make recommendations on Māori claims relating to Crown actions that breach Te Tiriti.

Forced neglect of Māori culture for several decades has led to intergenerational cultural dispossession. Now, the younger generation is leading Māori communities and individuals in reclaiming and recovering suppressed knowledge and understanding of te ao Māori (the Māori world view), mātauranga Māori (the body of ancestral knowledge of the living environment) and te reo Māori (the Māori language). Recently, mātauranga Māori was dismissed by several academics as 'not science', however major science and academic institutions have rejected this opinion, expressing respect for mātauranga Māori as a valuable knowledge system that is not at odds with Western empirical science[19].

Tikanga Māori is a recognised legal system of practices and traditional knowledge within Māori society, that also includes customs and spiritual dimensions beyond the legal domain. An example of tikanga Māori in legal use is the concept of kaitiakitanga in the Resource Management Act 1991, intended to reflect a Māori ethic of guardianship[20]. The Supreme Court has recently embedded tikanga Māori in law through its decision on an iron sand mining consent case.

Under te ao Māori, nature is an ancestor; accordingly, two natural beings, Whanganui River and Te Urewera (a former National Park) have been accorded legal personality. Te ao Māori is gaining importance in governmental and business activities, including infrastructure development, where meaningful engagement and tangible outcomes are still emerging.

FUTURE LIVEABLE CITIES

Cities are made of neighbourhoods where people live. From their homes they need to be able to get to work or school and to reach everyday essential places, such as the grocery store, the library, the dentist and the barber. They want to have access to open spaces too, such as a park and playing fields.

Moving around their neighbourhood and into adjacent neighbourhoods should be easy and safe. Walkways and cycleways should be well-maintained and buffered from traffic. Public transport should be convenient. The places between buildings should be beautiful, with street trees and places to stop and chat. Street lights should be functional but unobtrusive. Noises should be dampened, not amplified by architectures. Neighbourhoods are for living in. They need to be made liveable.

PATHWAYS TO POSITIVE IMPACTS ON PEOPLE

Pathways to Impact	Example Outcomes	SDG Targets	
Liveable communities	✓ Manage impacts, such as air quality, light pollution, noise and vibration, and improve amenity ✓ Use water sources of suitable quality for the project's water end uses, minimising demand on potable water supply, protecting the environment and supporting the use of alternative water sources ✓ Provide safe, affordable, accessible and sustainable transport systems ✓ Provide universal access to safe, inclusive and accessible, green and public spaces	3.6 Halve the number of global deaths and injuries from road traffic accidents 3.9 Substantially reduce deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 6.1 Achieve universal and equitable access to safe and affordable drinking water for all 6.4 Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity 6.5 Implement integrated water resources management at all levels, including through transboundary cooperation 11.1 Ensure access for all to adequate, safe and affordable housing and basic services 11.2 Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons 11.6 Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management 11.7 Provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	
Engaged people and communities	✓ Design and implement a stakeholder engagement strategy that recognises key stakeholder and community values, interests and concerns, and promotes inclusive, participatory approaches ✓ Create infrastructure that has been influenced by the local context, fits its setting, and meets the needs of the people who will use it, while preserving and enhancing scenic, aesthetic, cultural, community and environmental resources and values ✓ Deliver initiatives that contribute pronounced and long-lasting societal or environmental outcomes	11.3 Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management 12.8 Ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	
Culture and sense of place	✓ Maintain or enhance local heritage values across all infrastructure phases and raise awareness of these values with project stakeholders and the community ✓ Partner with Traditional Owners and mana whenua to identify opportunities for relationship building, co-design and prioritising sustainable outcomes	11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage 17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	

John Holland Group: Giken silent piler

#Liveable communities #Conserved ecosystems

PILING WITHIN NOISE, SPACE AND ENVIRONMENTAL CONSTRAINTS

Noise output from the Giken method is only slightly higher than regular speech.

The South West Metro Corridor (in Sydney) works are situated along a highly constrained rail corridor making plant access difficult. In Lakemba, the site boundary runs along the live rail track along the ridge of an embankment which drops to a protected roosting habitat for ibis and a busy suburban road. The site is set within a highly residential area. The project needed to replace 70m of timber retaining wall running along the ridge of the embankment.

Other methods investigated were not appropriate due to noise, space, and environmental constraints. The Giken method was identified as a potential opportunity for the works. Giken is a Japanese company that developed a 'Reaction-based' Hydraulic Pile Jacking Machine, also known as the Silent Piler. The Giken clamps onto the steel sheet piles already pressed into the soil and continuously moves along as each new pile is completed. This system has a particular benefit where vibration and noise are a concern.

The Giken was identified as the lowest risk method to undertake the works, some benefits identified using the Giken method were:

- A significantly smaller construction footprint. The area needed for clearing only required trimming saving an approximate 140m2 of vegetation from clearance.
- The Press-in method uses static load to install sheet piles, eliminating vibration and resulting in no impact to the soil or the slopes integrity preventing water contamination, as well as the railway track infrastructure. Traditional piling methods had a much higher likelihood of causing ground disturbance of the embankment resulting in sedimentation of the adjacent water body and potential destabilisation.
- Noise output from the Giken method is extremely low at approximately 63dB, only slightly higher than the noise of regular speech which was highly appropriate for the site conditions due to the fauna and residents in close proximity to the works. An added benefit of minimal noise is the increased safety for all site personnel, preventing hearing damage.
- A smart choice for out of hours operation. As works were designed to be completed out of hours, this was a considered choice for sensitive receivers in the surrounding area. It caused minimal disruption to residents and Sydney Trains lines only requiring 12 days for completion, with works completed during 24-hour continuous shifts. A total of 139 sheet piles were able to be placed during this time frame to complete the retaining wall.
- The requirement for earthworks was dramatically reduced when compared to other methods investigated for the works.
- Forecast useful life benefits. The steel sheet piles installed by Giken were designed for a life of 120 years, compared to 30 years for a traditional timber retaining wall.
- The Giken Power Unit has environmentally friendly specifications and is designed based on strict concepts for clean emissions and high combustion efficiency. The unit conforms to the latest exhaust emission standards EEC97/68EC Stage IIIA and EPA/CARB Tier 3. Additionally, biodegradable fluids (Piler Eco Oil and Piler Eco Grease) and environmentally friendly paint (toluene, xylene and lead free) are used as standard specification.

METRONET: Tunnel boring machine water recycling

#Liveable Communities #Circular economy

REDUCING WATER USAGE FROM THE OUTSET

Climate change and a growing population are having a profound impact on Perth's water supply.

The $1.86 billion Forrestfield-Airport Link is jointly funded by the Australian and Western Australian governments and will deliver a new rail service to the eastern suburbs of Perth – with three new stations at Redcliffe, Airport Central and High Wycombe. The rail link forms part of the METRONET vision to create liveable communities connected by world class public transport. The line will spur off the existing Midland Line near Bayswater Station and run to High Wycombe through twin-bored tunnels. First trains will operate on the new Airport Line in the first half of 2022.

In April 2016, the Public Transport Authority awarded the design, construct and maintenance contract to Salini Impregilo – NRW Joint Venture. From the outset, the project has worked to incorporate sustainable practices. Under ISC's V1.2 requirements, the project has achieved an 'Excellent' rating for its design submission. The project's As-Built rating is due for submission in late September 2021.

Tunnel Boring Machine (TBM) water recycling

A major component of the Forrestfield-Airport Link is the 8km twin bored tunnels, which extend from Bayswater to High Wycombe. Tunnel Boring Machines (TBMs) were used to excavate and line the tunnels with concrete segments. During operation, the TBMs required a continuous supply of water. This water was delivered to the cutting face during excavation, where it was mixed with spoil to create a slurry. This slurry was then pumped to the surface. As such, tunnelling was the most water-intensive phase of construction. Significant water savings were achieved through the establishment of a Slurry Treatment Plant (STP) at High Wycombe, which used a filter press and centrifuge to process the slurry, separating the excavated spoil from the water, which was then circulated back to the TBMs for reuse. This practice saved 2,740ML of water, the equivalent of more than 1,000 Olympic-sized swimming pools.

The importance of water in Perth

Climate change and a growing population are having a profound impact on Perth's water supply. Historically, the city relied on rainwater as its main water source. Today, hotter summers and drier winters have forced the transition to reliance on climate-independent water sources. Currently, dams cover 15% of Perth's water requirements while groundwater and desalination plants provide 39% and 43% respectively. While the city's needs are covered by these sources, water is still considered a precious resource. Throughout construction of the Forrestfield-Airport Link, SI-NRW JV and project subcontractors have made every effort to reduce water usage, successfully reducing potable water usage by at least 80%.

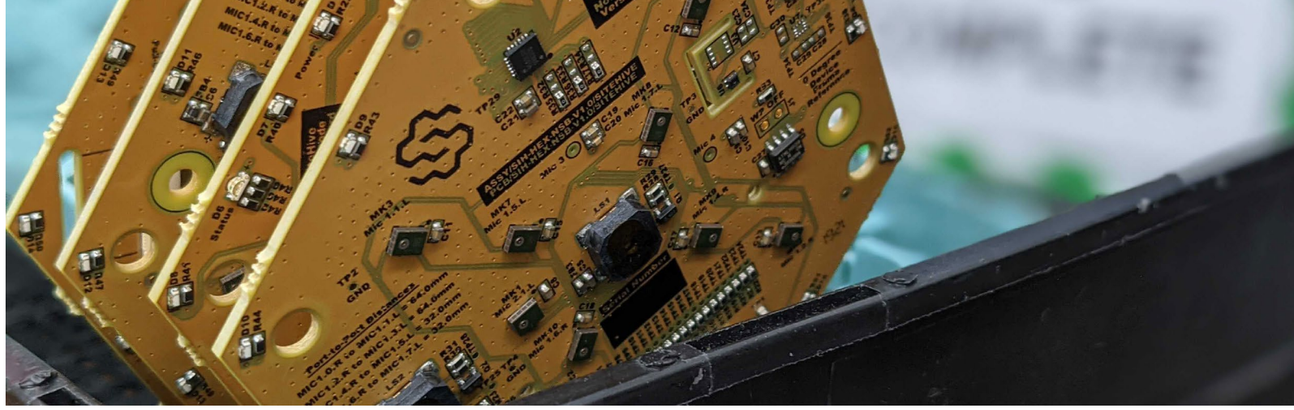


Slurry treatment plant at High Wycombe supporting tunnel boring

As one of Perth's key infrastructure projects, the project aims to enhance the liveability of Perth's eastern suburbs as well as support tourism and development through enhanced connection with Perth Airport. Achieving these outcomes without compromising sustainability is a continuous pursuit. Significant savings have been made in energy and materials, and as discussed here, water usage. The project commenced with the aim of reducing water usage from the outset. However, adjustments to construction methods have been made continually as opportunities for further water-saving have become apparent. In total, the project's water saving measures implemented for construction and operational phases of the project have saved a total of 3,922 ML of water.

Sitehive: Reducing construction noise, dust, vibration and water

#Liveable Communities #Innovation and knowledge sharing
#Healthy, inclusive workforce #Responsible, agile supply chain



SiteHive electronics built by CNS Precision Assembly, a social enterprise that provides meaningful employment for people with disabilities

A NEW TECHNOLOGY TO ENABLE MORE SUSTAINABLE CONSTRUCTION

Noise, vibration, air and water pollution can have negative effects on communities and the environment.

Across Australia, major construction projects are underway to improve the rail, road and building infrastructure. During the works, the environmental impact of noise, vibration, air and water pollution can have negative effects on communities, stakeholders, businesses and the environment.

To combat this, SiteHive developed and implemented a product initiative to improve and standardise the management of environmental impact during construction. By employing world-first new technology and automated processes, SiteHive aimed to enable a more proactive approach to managing environmental impact during construction. This approach will lead to healthier and more sustainable construction that minimises the impact on employees, the community and the environment.

Project objectives

The main objectives were to:

- Reduce the impact of construction noise, dust, vibration and water on communities, onsite teams and the environment.
- Use technology innovation to enable a proactive approach to managing environmental impact, which can be applied across all projects.
- Develop and implement a sustainable solution that utilises renewable energy.
- Address the additional issues caused by operating during COVID-19 by enabling remote site management and contact-free processes that contributed to COVID-safe work sites.

What we did

From a technology perspective, the environmental monitoring tools currently available were too technical, requiring specialist knowledge to manage, and generally provided only historical data. This meant that construction project teams could often only report on environmental issues after the fact, rather than resolve them as they happen.

SiteHive developed an environmental management solution that provides information in real time, along with rich contextual data, and that can be used by teams with little specialist knowledge. It allows project teams to proactively manage environmental factors on site as they happen, and thereby reduce their impact.

SiteHive includes both monitoring devices and environmental management software that is cloud-based and can be accessed from anywhere. Over the last year SiteHive has been deployed on more than 80 construction projects.

This started with an iterative process where we worked closely with project clients: SiteHive was first trialled, and the learnings fed back into the development process through technical and user experience workshops. The solution was then further tested and developed over a range of road, rail, regional and other infrastructure projects to ensure suitability across all scenarios.

During this process we worked in collaboration with a number of supplier partners, in addition to clients. For example, SiteHive partnered with CNS Precision Assembly - a social enterprise that provides meaningful employment for people with disabilities - to produce the electronics components of the technology. This allowed us to deliver a quality product in a socially sustainable way. We also collaborated with Generators Australia to enable the devices to be attached to solar-powered street lamps and light towers, allowing them to run on sustainable energy.

Project outcomes

The initiative delivered new tools for managing environmental impact on construction projects. The specific outcomes include:

- The ability to manage noise, dust, water and vibration on construction projects in a proactive way. With access to real-time data and contextual information, project teams can make quick, confident decisions. This leads to a reduction in environmental events, and a resultant decrease in community impact and complaints.
- The ability to identify the sources of noise quickly. The SiteHive Hexanode monitoring devices take pictures when they detect noise and SiteHive builds sound maps of the site, so that noise sources can be identified.
- Improved relationships with communities and clients. The information and processes allow the construction team to work collaboratively with stakeholders, sharing information and keeping them informed.
- Access to a complete record of site events. The system saves all environmental data and it can be accessed online at any time. Projects therefore have a full statement of record that can be used to respond to FOI requests, provide information to the EPA and other relevant bodies, and keep stakeholders informed.
- The ability to deploy monitoring devices using sustainable solar power, including using available resources such as street lighting. This has resulted in reduced energy consumption and allowed more monitoring to be conducted.
- Significant time and cost savings. Automated workflows and more efficient processes have reduced the time spent, while smart technology allows people to focus on other issues. This leads to estimated time and cost savings of 50% or more.

Stakeholder engagement

The new environmental management tools provide greater transparency and allow project teams to develop better relationships.

For communities, the initiative provides a proactive engagement tool that allows project teams to be more responsive and keep communities informed. Any on-site exceedances trigger an automatic report that can be shared proactively with the community. The SiteHive system also allows any complaints to be investigated and responded to quickly. This approach is changing community perceptions of construction, turning it into a more collaborative and less adversarial process.

For the project clients it provides access to a complete record of environmental data. The data is available online, and includes extensive reporting and graphical formats. This provides the client with total transparency, information for reporting purposes and greater confidence.

Summary outcome

Overall, the initiative has developed a best-practice solution for managing environmental impact in construction. The outputs include world-first environmental management technology, both monitoring devices and management software, that can be applied across any construction project.

The solution enables a proactive approach to managing environmental impact during construction that can be applied across all infrastructure and construction projects across multiple geographies, helping to make construction healthier, safer and more sustainable.

HEB: Te Ahu a Turanga Manawatū Tararua Highway

#Culture and sense of place #Healthy, inclusive workforce #Conserved ecosystems #Engaged people and communities



Mahi toi details on Parahaki Bridge, Te Ahu a Turanga: Manawatū Tararua Highway

CO-DESIGN IN A COMPLEX CULTURAL LANDSCAPE

Iwi are represented throughout the project, on the Alliance Board, at an iwi forum, at senior management and at the operational level.

It started with a slip

On ANZAC Day 2017, a major slip in the Manawatū gorge wiped out the road. The impact on communities and the wider region was immense. A new route was urgently needed to reconnect local communities and eastern and western Aotearoa. Te Ahu a Turanga: Manawatū Tararua Highway is the new 11.5km rural state highway that will reconnect two towns, Ashhurst and Woodville, over the Ruahine Ranges. The project is in its first year of construction after three years of planning and design, and is due for completion in 2024. Early on, Waka Kotahi NZ Transport Agency worked with iwi to trial a new approach to partnership. Five iwi have a connection to the project area and although they had a long history of interaction, they hadn't previously sat around the table together.

A new Crown-Iwi paradigm for partnership

In an historic first for Aotearoa New Zealand, iwi are partners in the Te Ahu a Turanga Alliance comprising Rangitāne o Manawatū, Rangitāne o Tamaki nui-a-Rua, Ngāti Kahungunu ki Tāmaki nui-a-Rua, Te Runanga o Raukawa (Ngāti Raukawa and Nga Kaitiaki ō Ngāti Kauwhata) along with Waka Kotahi NZ Transport Agency, HEB Construction, Fulton Hogan, Aurecon and WSP. Partnership is the heart of the project, which is built on the principles of Te Tiriti o Waitangi. Iwi are represented throughout the project, on the Alliance Board, at an iwi forum, at senior management and at the operational level. The Alliance's approach to partnership and co-design holds people and culture in the centre within a wider environmental context. The NZ$620 million project has been consented in record time because everyone is paddling in the same direction, on the same waka. The project was conceptualised, consented and designed with construction underway in less than three and a half years.

Mātauranga Māori approach to safety and wellbeing

We are building a road and modelling a new way of working. Te Ahu a Turanga is unique in that it is a major construction project centred around Mātauranga Māori (the Māori worldview). This approach integrates Te Ao Māori into the physical design of the highway, as well as influencing the way decisions are made and the culture that guides daily life onsite. When people join the project, they are introduced to the Alliance's charter and values, represented by our intricately carved Waka Tangata. We have opening and closing karakia at Alliance hui (or workshop) and before construction starts in an area. When whānau/workers sign in for the day, they are invited to reflect on their wellbeing using the Te Whare Tapa Whā app. The app is based on a Māori model of health and wellbeing developed by Professor Mason Durie. If someone registers a low score in a particular area, they are connected to support services. This holistic approach is one example of how our commitment to honouring biculturalism goes beyond promoting language – which we also do, as everyone on the project has the opportunity to learn te Reo Māori – into creating a nurturing workplace culture not usually seen in construction.



View of Parahaki Bridge from Parahaki Island, Te Ahu a Turanga: Manawatū Tararua Highway

Integrating cultural safety with construction

Cultural safety is critical to completing the highway on time and in a way that ensures iwi and local communities are proud of the result. To this end, we have established Te Pūtahi, the Iwi and Māori Outcomes Directorate for Te Ahu a Turanga. Te Pūtahi, a centralised portfolio of iwi and Māori-focused roles managed by the Kaiārahi (mentor), is a well-resourced team dedicated to leading the delivery of outcomes in key areas, such as employment and procurement; education and training; resource development; planning, design and cultural outcomes; and delivering te reo and tikanga initiatives.

Working together for broader outcomes

The project's partnership approach extends to working with others to achieve our social outcome goals that include building capacity and capability in our local communities and economies. We have partnered with the Ministry of Social Development to provide training in conservation through the Conservation Work Skills programme, and have received government funding to train 17 earthworks apprentices. We are also partnering with the Universal College of Learning to enable students studying infrastructure to do their practical studies on Te Ahu a Turanga. We continue to work with other agencies and our iwi partners on social housing solutions to support current housing need for the project, as well as leaving a lasting legacy by boosting local housing stock once the road is complete. The project has a strong commitment to treading lightly through our environment. Close to two million plants will be planted in the project area, along with a raft of conservation measures to provide ecological offsets and enhance waterways.

Te Ahu a Turanga is more than a road. Our efforts to leave our communities and our environment better than before we started are showing signs of success. In 2021 Te Ahu a Turanga won a planning and consultation award from the New Zealand Planning Institute; was a finalist in the SafeGuard; and is a current finalist in the Diversity Awards NZ in the Mātauranga Māori category.

Watercare: Central Interceptor

Infrastructure Sustainability Rating

IS Design EXCELLENT

#Culture and sense of place #Conserved ecosystems #Healthy,inclusive workforce #Engaged people and communities

CULTRAL MANAGEMENT AND ECOLOGICAL VALUE

Our Cultural Management Plan was developed under the guidance of mana whenua and is inclusive of te ao Māori, the Māori worldview.

The Central Interceptor (CI) is a 14.7km, wastewater tunnel that will clean up central Auckland's waterways. The CI is being delivered by Ghella Abergeldie Joint Venture (GAJV) on behalf of Watercare. Ghella has more than 150 years' experience with tunnelling and wastewater projects across the globe.

Cultural Management Plan

Our Cultural Management Plan was developed under the guidance of mana whenua representatives being one of the first of its kind in Aotearoa (New Zealand). It is inclusive of te ao Māori - the cultural landscape values of physical and metaphysical elements of the natural environment, including whenua (land), wai (water), hau (air), rerenga rauropi (biodiversity) and economic, social and cultural wellbeing.

Watercare facilitates a hui (meeting) every second month with representatives of 19 Tāmaki Makaurau mana whenua entities, called the Mana Whenua Kaitiaki Managers' Forum (MWKMF), which encourages proactive engagement between mana whenua and Watercare, builds strong and enduring relationships and enhances business outcomes. The Cultural Outcomes Group (COG) comprises CI representatives and a subset of the MWKMF and meets monthly to support the project team in delivering project outcomes with cultural aspects. The Cultural Management Plan was prepared under the guidance of the COG on behalf of MWKMF, Watercare and GAJV. It was then circulated to MWKMF members for further amendments and acceptance during subsequent hui.

Our Cultural Management Plan goes beyond a traditional Archaeological and Cultural Plan, which would focus on sites of cultural significance. Our plan ensures tikanga (traditional values) and mātauranga Māori (Māori knowledge) is a cornerstone of the project. The COG and Project Team work together to ensure mātauranga Māori is included across the project. In addition to the environmental focus, the COG guides workforce targets and development opportunities. Tame Te Rangi, Watercare's Mana Whenua Kaitiaki Managers Forum Chair and CI's Cultural Outcomes Group Chair says: 'The project's CMP is one of the first of its kind in Aotearoa. It has since been used by other Forum members as a template for their projects, which will lead to lasting industry change. This change can be built upon to include te ao Māori (the Māori world view), not only in implementation, but also in planning and design. By recognising, and providing for, the cultural landscape, we can deliver better, more sustainable infrastructure outcomes for current and future communities.'

This is a successful model for partnering with Mana Whenua and achieving meaningful integration of mātauranga Māori that has driven stronger environmental, social, and workforce outcomes. The COG continues to be a critical element of the CI's cultural value enhancement.

Ecological value methodology

We developed a methodology for assigning numerical value to the existing ecological value of our sites and the initiatives in our restoration plans to identify the most impactful and long-lasting options. This allowed us to demonstrate a 33% net ecological value enhancement and a 29% on ground enhancement in habitat connectivity in our leading IS design rating.

The driver was to focus our ecological enhancements directly on our sites to further improve our local environment and give the areas back to our neighbours better than when we arrived. This led to us foregoing any offset options and opting to develop a new methodology with Boffa Miskell. We compared initiatives such as bird roosts, riparian planting, seedling collection and green roofs and consciously selected initiatives to include in restoration plans.

Infrastructure Sustainability (IS) projects across Australasia primarily valued ecological improvement by the percentage offsets of land in m2. Our methodology has since been used for consent applications and other projects, namely Auckland Councils 'Restore Rodney East' and 'Pest Free Upper Harbour' and sets an alternative for ecological assessment under the IS Rating Tool. 'The CI provided the opportunity for a fresh and innovative approach to applying the IS Ecology rating', said Dr Ian Boothroyd, Senior Principal Ecologist at Boffa Miskell. 'We were able to develop a methodology that quantified ecological gains and that has a broader application to the infrastructure industry as a whole. We are very excited about what this means for infrastructure projects and the environmental benefits that this approach can bring.' Since this work informed our Ecological Management Plan, we have captured and released approximately 50 eels during work on a culvert and 74 native copper skinks while clearing vegetation on a worksite.

This improved process (beyond simply offsetting) can be picked up by any project in the construction and infrastructure industries to direct efforts toward meaningful ecological outcomes and can support the achievement of IS Ecology credits.



Project dawn blessing, Mangere

PEOPLE

PROSPERITY

Growing inclusive, resilient economies

Infrastructure is a key enabler of access to social and economic opportunity. We want an impact of our work to be national (and transnational) economies that are inclusive and resilient, so that people's livelihoods and quality of life are sustained.

ISSUES

INCOME AND WEALTH INEQUALITY

In Australia and Aotearoa New Zealand, income inequality is around the OECD average. The highest 20% income group has more than twice the average disposable income of the middle 20% income group and six times as much as the lowest 20% income group. In both nations, however, the wealth gap is of greater and growing concern. In Australia, the richest 20% own assets 90 times greater than the poorest 20%, while the poorest 5% of Australians are in debt[21]. In Aotearoa New Zealand, the richest 10% own 59% of assets and the poorest 50% of people own 2% of assets. Rising housing prices have widened the gap between owners and renters and older households are accumulating wealth through property and savings[22].

CULTURAL POVERTY AND HEALTH DISPARITY

Nearly 14% of the Australian population lives below the poverty line, measured as 50% of median income[23]. However, 31% of Aboriginal and Torres Strait Islander Australians below the poverty line, including as high as 53% in very remote areas[24]. Indigenous Australians carry a burden of disease 2.3 times that of other Australians and life expectancies are at least one decade shorter. They are deemed to be at high risk of violation of human rights and are among the most incarcerated people in the world[25].

In Aotearoa New Zealand, 13% of children live in a household that is experiencing material hardship, which means missing out on fresh fruit and vegetables, putting off visiting the doctor and being unable to pay utility bills on time .The rates are higher for Māori children (23%) and Pacific children (29%)[26]. Around 11% of Māori children and 17% of Pacific children live in households with a major problem with damp or mould, compared to a national average of 7%. Child poverty combines with inadequate basic healthcare and unhealthy housing to exacerbate health outcomes, and also affects cognitive, social-behavioural outcomes. Regular school attendance is 65% for all New Zealand students, but is lower for Māori and Pacific children at 48% and 51%, respectively[27].

WIDENING OPPORTUNITY GAP

Large and growing inequality leads to gaps in access to opportunity and poor development outcomes, entrenching disadvantage. Inequality is linked to obesity, violence, mental illness and suicide.

Nine in ten people on Youth Allowance in Australia skip meals, including one in five people who skip a meal everyday; one in three have withdrawn from their studies due to lack of funds[28]. Around 20% of Aboriginal communities live in overcrowded homes, which leads to a faster spread of illness. They are more likely to endure poor housing solutions that are not resilient to a changing climate and frequently experience water scarcity. The Indigenous youth suicide rate is four times that of other Australian youth[29]. Economic activity is concentrated in cities, creating a widening gap between regional and city experiences and outcomes. People living outside State capital cities are more likely to be in the lowest income quartile. Rural Australians face barriers such as unemployment, underemployment and youth unemployment, poor access to healthcare and inadequate access to the Internet.

Aotearoa New Zealand has one of the world's most unequal educational systems due, not to school quality, but family background factors, such as household income, which is leading to an intergenerational poverty trap[30].

VULNERABILITY TO CHANGE

The people most vulnerable to climate change are those who are most exposed to change, most sensitive to its effects or have reduced capacity to adapt. The result is that they are more likely to be left behind and more severely impacted by change. Measures toward improving adaptive capacity must prioritise vulnerable groups, including the very young and the elderly, those who work in primary industries, those exposed to extreme weather events, such as tidal surges and bushfires, and the poorest, who lack access to insurance.

'The Queensland Government through its Business Case Development Framework seeks to integrate sustainability and resilience considerations from the outset in new infrastructure proposals. With a focus on ensuring the enduring value of our investments, we ask our infrastructure delivery agencies, and sustainability practitioners, to ensure sustainability is a proactive front-of-mind activity throughout the proposal development. Viewing each investment from a whole-of-life and whole-of-system perspective early in the proposal development can best support long-term sustainability outcomes.'

Graeme Garrett, Executive Director, Infrastructure Planning and Advisory, Department of State Development, Infrastructure, Local Government and Planning, Queensland Government

PATHWAYS TO POSITIVE IMPACTS ON PROSPERITY

Pathways to Impact	Example Outcomes	SDG Targets
Adaptive capacity	✓ Develop resilient infrastructure that contributes to broader community resilience and responds to potential shocks and chronic stresses ✓ Identify, assess and treat direct and indirect risks to assets from climate change and natural hazards; in particular, those assets associated with vulnerable communities ✓ Identify, assess and treat risks to assets associated with nature loss and nature change, in terms of ecosystem stocks and flows	1.5 Build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters 11.5 Significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global GDP caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations 11.b Substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement holistic disaster risk management at all levels 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries 13.2 Integrate climate change measures into national policies, strategies and planning 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Measures of socioeconomic value	✓ Map project benefits to identified socioeconomic needs ✓ Partner with the community to implement initiatives that contribute positively to pronounced and long-lasting societal outcomes ✓ Set targets for the inclusion of disadvantaged groups in recruitment, training and retention and development programs ✓ Incorporate social outcome requirements in sustainable procurement policies and practices	1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and achieve substantial coverage of the poor and the vulnerable 8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors 17.19 Build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product

'State significant projects can affect people in many ways, both positively and negatively. Identifying and understanding social impacts helps to inform responses that aim to avoid, mitigate or reduce negative impacts and enhance positive impacts. 'Social impacts' generally refer to the consequences that people experience when a new project brings change. 'People' can be individuals, households, groups, communities, or organisations.

The Social impact Assessment can be used to identify, predict and evaluate likely social impacts arising from a project and propose responses to the predicted impacts. Social impact Assessment assesses projects from the perspectives of people, which means developments are more likely to be socially sustainable. This allows proponents to respond to likely impacts and understand what the proposed change will mean for people. It allows people to be considered early, so project refinements can occur, and people can be part of the project development.

The Social impact Assessment aims to ensure projects are effectively integrated into the context and communities where they are located, providing maximum benefits whilst also supporting timely project assessment and delivery.'

Lisa Honan and Jennifer Richardson, Department of Planning, Industry and Environment, NSW Government

Transurban:
Study of driver behaviour during extreme weather

#Adaptive capacity #Sustainability-aligned governance

TCFD-ALIGNED ASSESSMENT OF CLIMATE-RELATED FINANCIAL RISK

This study enhances the organisation's understanding of potential long-term changes to customer driving behaviour due to extreme weather events.

In early-2021, Transurban undertook a data-driven investigation into how extreme weather events affect driving behaviours and Australian Linkt customers' decisions to use our roads. Ultimately the aim was to understand the potential climate-related financial risk associated with extreme weather events and impacts on future revenue, in line with the Task Force on Climate-Related Financial Disclosure (TCFD) recommendations and Transurban's Climate Change Framework.

The study focused on the impact of three extreme weather scenarios: a torrential heavy rain event, strong winds, and extreme heat. The research used qualitative and quantitative methods to explore this area with Linkt customers in Queensland, New South Wales and Victoria.

Stage 1 key findings

Heavy rainfall and severe wind have the greatest impact: It was found that heavy rainfall tends to create concern not only about the safety of driving conditions but also about the actions of others on the road, in turn often leading to re-evaluation of whether a trip is essential. When faced with heavy rainfall, 81% of customers were likely or extremely likely to drive their own vehicle. Of the 81%, 75% of these customers were more likely to use toll roads when faced with heavy rainfall. Severe wind was observed to create a sense of nervousness however was ultimately assumed to pass more quickly than heavy rain. By comparison, extreme heat was claimed to have little-to-no impact on travel decisions and driving behaviour with 68% of customers indicating they would continue their trip as planned.

The default option is to delay a trip if considered non-essential: The extent to which drivers felt comfortable driving in extreme weather depends on a range of variables such as the time of day. The study showed most drivers avoided, delayed or deferred driving in extreme weather, if possible, with heavy rainfall being the biggest extreme weather event affecting decision-making. One in two customers would re-evaluate the importance of a trip under these conditions.

Toll roads were considered more desirable in extreme weather: With dynamic speed limits, fewer close trees, better visibility, wider lanes, fewer access points and a variety of other measures, toll roads were seen as more appealing and ultimately safer. In the case of extreme weather, these benefits become more prominent, and in turn led to being the preferred route of travel.

Building on the initial study findings, Transurban conducted a statistical analysis of the behaviour of traffic on assets in Brisbane, Sydney and Melbourne during historical extreme weather events over the past five years. For each asset, the monthly average daily traffic per type of day (weekdays and weekends/public holidays) for the analysed timeframe (the mean) was calculated, resulting in two sets of averages per month. Subsequently, for each day the percentage difference to its respective mean was calculated. Finally, the average of that difference for each weather category was obtained. Statistical tests were then undertaken to verify the significance of the results.

Stage 2 key findings

Melbournians feel more comfortable driving on wet days: The three cities have very different weather patterns which seem to have an impact on traffic behaviour. Melbourne receives half the amount of rain than Brisbane and Sydney per annum, however, rainfall is scattered throughout the year, with a higher number of wet days. No significant difference was found between dry and wet day traffic patterns, meaning that changes to traffic patterns during these days cannot be attributed to rain. Heavy and very heavy rain affects traffic to some extent. This was observed particularly in Brisbane and Sydney, where these events are more common. Results were consistent between roads, especially in Sydney (Figure 7). There were limited very heavy rain events observed in Melbourne.

*Figure 7: Heavy rainfall impacts across the Australian market**

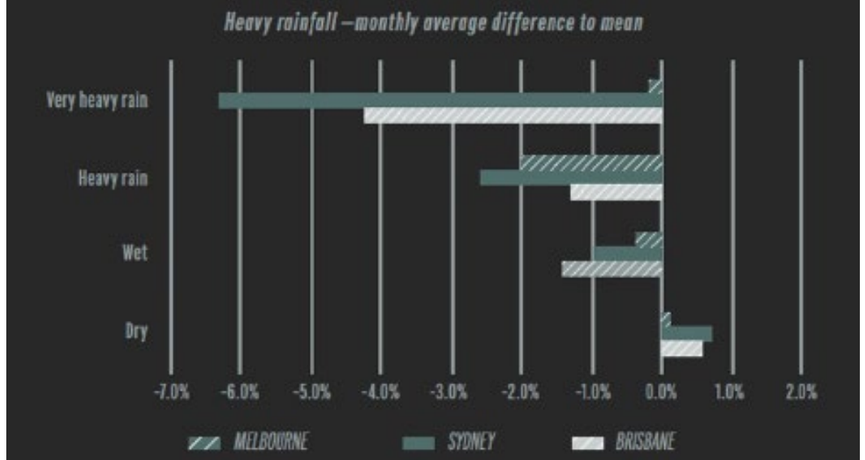


*Figure 8: Extreme heat impacts across the Australian market***



**Rainfall events were classified using the Bureau of Meteorology categories as dry (less than 1mm of precipitation), wet (between 1 and 10mm), heavy rain (between 10 and 30mm), and very heavy rain (more than 30mm of precipitation)*

*** Extreme heat was classified according to the maximum temperature recorded during the day as normal (below 35°C), hot (between 35°C and 40°C) and very hot (more than 40°C*

Rain affects traffic behaviour differently according to the type of day: Heavy and very heavy rainfall events have higher impacts on weekend traffic, as discretionary and leisure travel is expected to be more sensitive to the weather. During dry weekends, traffic on the motorways is higher than average. During the school term, heavy and very heavy rainfall days were observed to have less impact on traffic as there is a greater need to travel for non-discretionary purposes.

Extreme heat has little to no impact on travel behaviour: Neither hot days nor very hot days were statistically significant for the purpose of this analysis, meaning that the variations to the traffic activity during these days cannot necessarily be attributed to this factor. This is evident in Figure 8.

Ultimately this study enhances the organisation's understanding of potential long-term changes to customer driving behaviour due to extreme weather events and will continue to be monitored in the future.

PROSPERITY

Jacobs: Waratah and Wyee stations upgrade

Infrastructure Sustainability Rating

As Built EXCELLENT

#Adaptive capacity #Low carbon, low energy use economy #Innovation and knowledge sharing

BUILDING PATHWAYS TO A SUSTAINABLE, DECARBONISED WORLD

Our biggest opportunity to reduce carbon emission, affect climate change and leave both the planet and society better than they are today, is through the work we perform for our clients.

In 2021, the world's attention remains focused on climate change, with the United Nations describing it as a 'make or break year' for action. To deliver the carbon emissions reductions required to keep global temperature rise below the 1.5C threshold, we must reduce carbon emissions and embed sustainable outcomes across industry and society on a global and local scale.

At Jacobs, we know that our biggest opportunity to reduce carbon emission, affect climate change and leave both the planet and society better than they are today, is through the work we perform for our clients. We are embracing this responsibility and tackling the challenge head on through the major infrastructure projects we are delivering for our clients and the communities they serve. Every project we work on, no matter what size, presents an opportunity to reduce carbon emissions generated from its design and construction and from ongoing operations over the lifetime of the asset. We are actively working with clients to help them achieve their decarbonization goals, manage risk and improve climate resilience.

Delivered in partnership with Gartner Rose for the NSW Government as part of the Transport Access Program (TAP), the Waratah and Wyee Stations Upgrade projects were great examples of how even small projects can deliver significant sustainability outcomes and contribute to a more climate positive future. The projects were awarded the first 'Leading' As Built rating under TAP, achieving numerous positive outcomes for the local environment and community. The project reduced the ongoing energy needs of the two stations by up to 31% and reduced its carbon emissions by 32% (4,367 tCO2e). This was driven by design initiatives including reconfiguring the cooling systems and undertaking cost benefit assessments and market analysis to specify high efficiency cooling systems for station equipment and service rooms. They also achieved a 9% reduction in materials footprint through material saving initiatives and implemented an increase of more than 50% in biodiversity offset requirements across both sites, providing enhanced ecological benefits. Planting was concentrated in the under-utilised space at the front of the stations and, in time, will contribute to cooling the surrounding urban environment. The use of drought-resilient native planting was one of a number of choices made throughout the design process to reduce the future water needs of the stations and deliver a 43% reduction in water use over the lifetime of the asset.

For many organisations, decarbonising their assets and operations can seem like a daunting and complex task. To help clients navigate the challenge, we recently launched our Net Zero Lab, a collaborative and interactive program where we work with clients to understand their carbon footprint, set emission reduction targets, develop and operationalise decarbonisation strategies and manage performance to bring about lasting change.



Transport for NSW, with students from nearby Callaghan College and two local artists (Nick Stuart and Bronte Naylor), completed a new artwork at Waratah Station inspired by local flora and fauna. (Image: Waratah Station Upgrade, Transport for NSW, 2021)

PROSPERITY

Main Roads Western Australia: Albany Ring Road

#Measures of socioeconomic value #Responsible, agile supply chain

LOCAL AND SOCIAL SUSTAINABLE PROCUREMENT

Our procurement initiatives have been designed to create more opportunities for local jobs, businesses and in turn help to bolster and support the recovery of the State's economy.

At Main Roads, we rely on our supply chain to deliver tasks critical to our overall success. The State's policy on sustainable procurement requires us to demonstrate that we have considered sustainability in our procurement of goods and services. Sustainable Procurement and Buy Local is a key focus area of our organisation, and 'Procurement Practices' continue to be one of our most material aspects identified in our annual corporate Materiality Assessment. We have gone beyond the requirements of this policy to reflect this in, not only our processes for procuring goods and services, but also in procuring works.

Main Roads, along with our Portfolio colleagues, is playing a key role in the state's COVID-19 economic recovery strategy with an unprecedented level of investment in road and rail construction projects, together with procurement initiatives designed to create more opportunities for local jobs, businesses and the economy. In 2020-21 the Western Australian government's current program of major road projects is worth $2.37 billion and will create and support around 13,000 jobs. Main Roads has fast-tracked the tendering process for a number of these projects to help stimulate the economy in response to the impact of the COVID-19 pandemic.

Our major projects use the Sustainable Procurement credits in the Infrastructure Sustainability (IS) Manuals as guidance to demonstrate the extent to which we consider sustainability in preparing for and purchasing goods and services. Another key driver behind this is our commitment to enhance and develop both the local and circular economy within Western Australia. Through the alignment of our projects with the Sustainable Procurement credits, we are supporting the following UN SDGs, in particular SDG 8 Decent Work and Economic Growth and SDG 12 Responsible Consumption and Production.

Sustainable procurement policies in action

One of these major projects is the Albany Ring Road, which will provide an 11.5km freight route around the City of Albany for the transport of grain, fertiliser, woodchips and other goods to the Port of Albany. It will allow heavy vehicles to bypass the urban areas of the city, reducing congestion and improving safety for local and tourist traffic, as well as pedestrians and cyclists. Decmil Southern Pty Ltd are delivering the Project.

Sustainable Procurement and aligning with local policies such as the Western Australian Building Local Industry Policy and the Buy Local Policy is a focus area for the Project Team. Over $3.4 million has been allocated so far to Buy Local Spend on the Project, and this expenditure is expected to increase as the Project progresses towards completion. Buy Local Spend supports the sustainable development of the supply chain and enhances the circular economy, while strengthening the local Albany economy.

The Project has used a Targeted Procurement and Commercial System to capitalise on the strengths of local businesses. Types of local companies procured on the Project include Surveyors, Soil Analysts and Geotechnical Specialists, Specialist Civil Engineers, Labour Hire, and Earthmoving Equipment and Operators. This creation of the System was a result of early planning work, where a sustainability target to monitor the economic spend within the City of Albany during construction was identified prior to the Request for Proposals stage of the Project. This early work ultimately led to Decmil Southern using their Targeted Procurement and Commercial System developed by their Commercial Team to ensure local businesses were invited to form part of the supply chain needed to deliver the Project.

In addition, we promote social procurement initiatives such as direct purchasing from Western Australian disability enterprises and Aboriginal businesses, with Aboriginal procurement, employment and training targets mandated in all our major infrastructure and maintenance contracts.

Our procurement initiatives have been designed to create more opportunities for local jobs, businesses and in turn help to bolster and support the recovery of the State's economy. In doing so we apply the Government's Buy Local Policy in the evaluation of tenders and stated commitments are included in the awarded contract to report on Buy Local commitments. WAIPS applies to all our contracts that meet the value thresholds and tenderers are required to submit local participation plans to detail employment and local subcontracting opportunities if awarded the contract.



Albany Ring Road under construction

PROSPERITY

Building a world class industry

ISSUES

We want the impact of our work to be the development of a world-class industry in Australia and New Zealand.

PRODUCTIVITY AND DIGITAL DISRUPTION

The world economy has grown 2.6% in the last two decades, yet construction labour productivity growth has sat at 1%, attributed to dependence on public sector spending, industry fragmentation and mismatches in risk allocation and rewards[31]. The Construction Sector Accord is a joint commitment from the New Zealand government and industry to work together to create a high performing construction sector. The fourth industrial revolution has the potential to revolutionise sector productivity, through the uptake of new technologies such as data analytics, BIM, IoT, digital twins, drones, real time data, remote monitoring, smart sensors, smart meters and 3D printing. Cybersecurity of hyperconnected networks is a growing concern.

RECOVERY FROM COVID-19

Skills inflows have been interrupted by border closures, demanding a strengthening of in-country development of talent (which could also help address diversity and inclusion issues), while certainty in the pipeline will be crucial to maintaining job security for engineering and design practitioners. Regulatory support has included the New Zealand COVID-19 Recovery (Fast-track Consenting) Act 2020, to be repealed after two years, while the Government worked with industry to co-create a Rapid Mobilisation Playbook. Global supply chain disruptions have prompted localisation of logistics options and adoption of technologies that increase self-sufficiency. Public transport patronage has dropped and may not recover to pre COVID-19 levels due to public health concerns. Remote working has suited many employees and employers, alike, and is likely to continue for at least 10% of all workers. People working at home may become more concerned about domestic energy, water and waste, which could change how home systems interact with public networks. Demand for local amenities may grow, giving support to '20-minute city' reconfigurations. Connectivity demand has highlighted the need for a higher performing, well-distributed Internet that minimises energy waste and geosocial disadvantages.

BETTER BUSINESS CASE

To reduce the infrastructure deficit, planners need to present a compelling business case that finds funding. In a volatile, uncertain, complex and ambiguous (VOCA) context, however, asset owners must continuously replan, and only projects aligned to long term objectives or with inherent flexibility (eg modularity) can be signalled as 'no regret'. The industry must move from binary go/no go cost-benefit analysis toward adaptive solutions and real options assessment. What really counts is durable, large scale social impact through coordinated transport, waters, energy and communications networks. In Aotearoa New Zealand, the proposed Strategic Planning Act (SPA) will provide a legislative framework for mandatory regional spatial planning.

PARALLEL PUBLIC AND PRIVATE INVESTMENT IMPETUS

Through competition for assets and shifting investor motivations, commercial sector investment criteria are increasingly aligned with public sector initiatives to better integrate social outcomes, such as the Living Standards Framework in New Zealand. Post COVID-19, investors are likely to be more diligent around risk assessment, contingency planning, insurance and contractor liquidity. Integrating sustainability outcomes and impacts into design, delivery and operation of assets is paramount to lowering the industry's risk profile. Potentially material ESG risks increasingly being considered by investors include climate change, nature loss, land use change, modern slavery and human rights abuses in the supply chain, worker health, safety and mental wellbeing and damage to cultural property and taonga (treasures).

ASSET RESILIENCE TO CLIMATE AND NATURE CHANGE

The financial markets are shifting out of climate-risked assets toward those aligned with a low carbon, climate resilient future. Aotearoa New Zealand has introduced legislation to mandate climate-related financial risk reporting from FY2023, aligned with the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD). The Australian prudential regulator has also issued TCFD-aligned guidance. A new Taskforce on Nature-related Financial Disclosures is currently building on the work of the TCFD to deliver a framework for organisations to report and act on evolving nature-related risks, to support a shift in global financial flows toward nature-positive outcomes. Over time, the TCFD and TNFD frameworks will become complementary.



Building a world class industry



‘No gain without pain. When we have a pretty good idea of what we need to do in terms of actions to deliver sustainability, yet we are still not making as much progress as the planet needs, then it is time to look at behaviours and culture or people within projects and organisations. Only when we really get to the heart of how people think can we figure out how to reshape behaviours and culture to change the way they act, so we can do better for people and the planet. We can’t keep avoiding these tough conversations and challenging transformations. There is no doubt that it won’t be easy, however what we have observed is that when the focus is on behaviours and culture then that is when the magic happens, and real progress comes about and impact can be realised. So who is up for real change? Let’s get a collective discussion going on how to change culture.’

Dr Viv Heslop, Global Lead – Built Environment Transformation, Edge Environment

PATHWAYS TO POSITIVE IMPACTS ON THE INDUSTRY

Pathways to Impact	Example Outcomes	SDG Targets
Sustainability-aligned governance	✓ Embed project’s sustainability commitment, objectives and targets into governance and continuous improvement processes and to publicly commit to and report on progress ✓ Identify, assess and manage key sustainability risks and opportunities relevant to the project context and meaningful to affected stakeholders and project partners ✓ Report publicly on sustainability performance.	12.6 Encourage companies to adopt sustainable practices and integrate sustainability information into their reporting 16.5 Substantially reduce corruption and bribery 16.6 Develop effective, accountable and transparent institutions at all levels 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels 17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries’ share of global exports 17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships
Healthy, inclusive workforce	✓ Increase industry capacity and capability through identifying skill needs and gaps, leveraging employment opportunities, and improving outcomes for people (eg IS training) ✓ Support a positive workplace culture and employee health and well-being ✓ Support a diverse and inclusive working environment and monitor and publicly report on diversity metrics for identified groups e.g. pay-gap data, turnover rates ✓ Implement sustainable site accommodation facilities that reduce environmental impacts and support site worker wellbeing with a focus on internal environment quality, energy use, water use and resource efficiency	3.5 Strengthen prevention and treatment of substance abuse 3.6 Halve the number of global deaths and injuries from road traffic accidents 4.4 Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship 4.6 Ensure all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy 5.1 End all forms of discrimination against all women and girls everywhere 5.5 Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making 8.5 Achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value 8.6 Substantially reduce the proportion of youth not in employment, education or training 9.2 Promote inclusive and sustainable industrialization and significantly raise industry’s share of employment and GDP 10.2 Empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status
Innovation & knowledge sharing	✓ Reward innovative initiatives and outcomes in delivering sustainable infrastructure ✓ Share new or updated knowledge on issues and outcomes important to infrastructure sustainability (eg ISC conferences and webinars) between projects and more widely within industry	9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, encouraging innovation and substantially increasing the number of research and development workers
Responsible, agile supply chain	✓ Select suppliers, goods or services that contribute to achieving the project’s sustainability objectives and engage with the market to drive innovation ✓ Manage and reward supply chain performance against the project’s sustainability objectives and targets ✓ Establish a procurement framework that enables achievement of the project’s sustainability objectives through managing the material supply chain sustainability risks and opportunities ✓ Use sustainability certified products and supply chains to address supply chain risks and opportunities	8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and end child labour in all its forms 8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment 10.1 Progressively achieve and sustain income growth of the bottom 40% of the population at a rate higher than the national average 10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard 12.7 Promote public procurement practices that are sustainable

ANZ:
Sustainable finance

#Sustainability-aligned governance

Infrastructure Sustainability Rating

Design EXCELLENT

FINANCING THE DELIVERY OF KEY SUSTAINABLE INFRASTRUCTURE

Our lending capability puts us in a unique position and we are increasingly involved in the infrastructure sector.

ANZ's Purpose is to shape a world where people and communities thrive. Under our Purpose, we have a clear focus on three priorities – housing, environmental sustainability and financial wellbeing. Our ESG strategy to improve the financial wellbeing and sustainability of our customers, provides a clear mandate for how we act and make decisions with sustainability front and centre. Through helping finance the delivery of infrastructure projects, ANZ is delivering on our Purpose and ESG strategy. The bank has a long history of supporting key infrastructure developments throughout Australia and New Zealand. Our lending capability puts us in a unique position, and we are increasingly involved in providing sustainable finance solutions to customers in the infrastructure sector.

Canberra Light Rail Project – Green Loan

ANZ was joint Sustainability Coordinator for a 2020 transaction with Canberra Metro consortium to finance the first stage of the Canberra Light Rail project, an electrified urban rail system which aims to run on 100% renewable power. The project's Stage 1 was awarded an Excellent IS Design rating. This financial transaction saw an existing facility refinanced to qualify as a green loan under the Climate Bonds Initiative (CBI) Low Carbon Transport criteria and marked the first certified Green Loan for a public-private partnership in Australia.

Royal Adelaide Hospital – Sustainability Loan

ANZ helped lead the sustainability coordination of a 2021 loan to refinance Royal Adelaide Hospital with Celsus, the private partner and commercial operator of the hospital. The RAH is the largest public hospital in South Australia, providing clinical care for an estimated 85,000 inpatients and 400,000 outpatients each year. The RAH construction project was awarded a 4 Star Green Star - Healthcare As Built rating from the Green Building Council of Australia. The financing was Australia's first 'use of proceeds' type Sustainability (Green and Social) Loan transaction under both the Asia Pacific Loan Market Association's (APLMA's) Green Loan Principles and the Social Loan Principles.



Canberra Light Rail, courtesy of Canberra Metro

Kāinga Ora – Wellbeing Bonds

ANZ was a Joint Lead Manager for a 2021 transaction with Kāinga Ora – Homes and Communities to issue NZ$600 million of 7.5-year wellbeing bonds to social housing initiatives in New Zealand. Kāinga Ora, which means wellbeing through places and communities, provides tenancy services to about 187,000 public housing tenants and develops and maintains more than 68,000 properties throughout New Zealand.

Governments – Green, Social and Sustainable Bonds

ANZ has supported State governments and government-related entities in Australia, over many years, in funding critical green and social infrastructure through labelled green, social or sustainable bond issuance. In 2021, this included acting as Joint Lead Manager for Queensland Treasury Corporation's AU$3 billion Green Bond and as Joint Lead Manager and Sustainability Bond Coordinator for the Treasury Corporation of Victoria's inaugural AU$2.5 billion Sustainability Bond. ANZ has also worked with the National Housing Finance and Investment Corporation across all their prior Social and Sustainability Bond issuances to date. This funding helps States and government-related entities deliver resilient and sustainable infrastructure projects.

Perspektiv:
Sustainability professionals

#Sustainability-aligned governance

SUSTAINABILITY PROFESSIONALS HAVE NEVER BEEN MORE IMPORTANT

Societal expectations are evolving, and stakeholders are demanding economic, environmental, and social value. New skills and outlooks are required, and sustainability professionals should be at the heart (gut and mind) of your organisation, driving new and necessary outcomes.

The growth of Perspektiv, a consultancy dedicated entirely to sustainability, is testament to the increasing importance of sustainability professionals. Perspektiv has grown from February 2017 to turning over $2 million in our last financial year. Today, Perspektiv employs 20 people and has yet to have a single employee leave. We are a 'jobs and growth' success story within a pandemic and a rapidly changing infrastructure industry.

The creation of sustainability jobs is one of Perspektiv's greatest achievements, attributable to being a values-driven organisation with sustainability at our core. People want to tackle and engage with the most wicked problems, and they also want to thrive… whilst they may not achieve revolutionary outcomes every day, they want to feel like their work really matters. We are committed to the pursuit of the United Nations Sustainable Development Goals and believe that they are the best way to create economic, environmental and social value for people everywhere.

We also believe there are untold 'jobs and growth' opportunities to be realised by organisations pursuing sustainability agendas - and by genuinely listening to their sustainability professionals and acting on their advice, organisations can accelerate change, creating a better economy with more opportunities for everyone and respect for everything. If you don't already have sustainability professionals within your teams (and on your boards), it might be time to go and get some.



Autodesk: Impact strategy

#Sustainability-aligned governance

AUTODESK IMPACT STRATEGY

We are working to accelerate industry transformation through cross-sector collaboration and policy advocacy and by catalysing innovation between and beyond our industries.

At Autodesk, our progress demands that we work within our business, in partnership with our customers and beyond our industries to advance a more sustainable, resilient and equitable world.

Improving our operations

Our advanced sustainable business practices are setting the standard within Autodesk's culture, governance and operations. These practices help align and activate diverse employees to make a positive impact at work. We are proud to announce that Autodesk is now a net zero GHG emissions company across our business and value chain, following through on our commitment set last year. We attained our decade-long science-based GHG emissions reduction target in 2019.

Partnering with customers

We empower innovators to harness data, automation and insights to optimise the impact of design and make decisions to advance a more sustainable, resilient and equitable world. We support our customers with tools that tackle the total carbon impacts of the building lifecycle. The Embodied Carbon in Construction Calculator (EC3) incubated at the Carbon Leadership Forum with input from nearly 50 industry partners helps our customers choose carbon-smart materials that have lower embodied carbon. EC3 uses information from publicly available datasheets, enabling building professionals to compare different materials in minutes, rather than taking days and entire teams as in years past. Project materials data can be transferred directly from Autodesk® BIM 360® with the free, easy-to-use EC3 app. The materials data available through EC3 has more than doubled since the tool was launched in 2019.

Advancing industries

At Autodesk, we are working to accelerate industry transformation through cross-sector collaboration and policy advocacy and by catalysing innovation between and beyond our industries. Through the Autodesk Foundation, we invest in entrepreneurs and innovators scaling early-stage technologies that have the potential to dramatically reduce GHG emissions. We also fund accelerators, incubators and impact funds to bolster the growth of the climate start-up ecosystem, increasing the number of climate technologies that reach commercialisation. We prioritise sectors where our design and make expertise is particularly beneficial, such as renewable energy, electrification of transportation and refrigeration, building and industrial energy efficiency and materials innovation and efficiency.

Our efforts are aimed at advancing positive outcomes across three primary areas - energy and materials, health and resilience and work and prosperity - derived from the UN SDGs and focused to align the top needs of our stakeholders, the important issues of our business and the areas in which we are best placed to accelerate positive impact at scale.

Energy and materials: We provide our customers with the tools to enable better energy and material choices, reducing carbon emissions and waste. Key aspects relate to energy, materials, waste, and supply chain. Lean construction, for example, enabled by Autodesk Construction Cloud, supports higher quality, more efficient construction projects by allowing head contractors, subcontractors and owners to optimise workflows. This increases overall productivity and reduces risk throughout the project lifecycle. When tradespeople are empowered to make decisions that affect the project schedule, bottlenecks are avoided, waste is reduced and projects proceed more smoothly. Expanding these capabilities, we have invested in technology that uses artificial intelligence and machine learning to extract and process data from project plans and specifications, improving project quality, efficiency and risk management.

Health and Resilience: We help our customers accelerate the design and make of places and products that are safer, healthier and more resilient, providing increased wellbeing and the opportunity for adaptation. In partnership with Deloitte, the Autodesk Foundation recently delivered a Construction Resiliency Playbook with examples, insights and actionable steps on how to be more resilient in construction. Solutions include creating stronger technology and data programs and making teams, business models and processes more resilient. One recommended future-proofing step is to embrace industrialised construction. Using innovative building techniques such as design for manufacturing and assembly and prefabrication, firms can move, make and operate information up into design. Industrialised construction is growing in use and importance as it helps companies achieve certainty in cost and schedule and enables teams to adapt to rapid, unexpected changes.



Stock Image

Work and Prosperity: Autodesk is actively working toward positive outcomes across equity, access and facilitating the acquisition of in-demand skills of the future. Key areas are diversity, inclusion, mindset and skills and learning. Through the Autodesk Foundation, we invest in entrepreneurs and innovators who prepare workers to thrive in the era of automation, and in solutions, policies and research that help workers and employers prosper now and in the future. We recognise the crucial role that a range of organisations play, including government, educational institutions and other employers.

John Holland Group: Low carbon concrete trials

#Innovation and knowledge sharing #Low carbon, low energy use economy

PROOF OF CONCEPT FOR LOW CARBON CONCRETE

Temporary works are a great opportunity: workability and performance testing can take place in low-risk environments.

Alternatives to traditional concrete are gaining worldwide popularity as an effective way to reduce carbon emissions while diverting waste from landfill. Low carbon concrete demonstrates great performance characteristics including increased durability, early strength gains and good workability. However, there is yet to be widespread implementation of low carbon concrete in major road construction projects. This case study summarises a series of low carbon concrete trials conducted by the John Holland CPB Contractors Joint Venture (JHCPB) within structural and non-structural works in both temporary and permanent areas of the Rozelle Interchange Project (RIC). The RIC is the fifth and final stage of the WestConnex tunnelling Program which is the largest road Infrastructure project in Australia. The project has applied a bespoke low-carbon concrete to replace up to 70% cement content, using 8%-15% crushed glass sand as fines replacement. It includes 4-6kg/m3 of 100% recycled macro polypropylene fibres in lieu of steel mesh. Implementation in permanent and temporary structural and non-structural areas started in early 2020.

Results from Low Carbon Concrete trials showed satisfactory performance of the custom concrete mix implemented, which involved pouring of over 1200m3 across numerous surface site areas. This has facilitated the diversion to date of 140 tonnes of glass sand and 570kg of plastic fibres from landfill for a total reduction of approximately 127 tCo2e emissions. Challenges and lessons learned so far have been compiled and summarised in the WestConnex Rozelle Interchange Alternative Concrete Solutions: A series of research and development case studies exploring the use of sustainable concrete alternatives on Rozelle Interchange (or Major Construction Projects. 201211-alternative-concrete.pdf (rozelleinterchange.com.au)

General challenges faced by the sustainability team include:

- Building up the appetite for the use of a new concrete type that had not been used before in other RMS/TfNSW projects
- Ensuring the proposed alternatives met client specifications (durability and performance)
- Ensuring workability was the same as normal concrete mixes (no additional lead time on orders, batching and pouring) to avoid delays, which could negatively impact the Project program.
- Obtaining quality and design approvals
- The need to seek contractual departure early in the design process from the material originally specified
- Building trust with the construction teams to accept and drive the use of this type of concrete

Key lessons learned include:

- Starting early: Timing is critical. Retrospective change can be costly; and innovations can be cost effective and are easier to approve and implement if assessed early in the project life cycle.
- Understand the Project approval pathways: Approval can be obtained more efficiently with a plan that includes hold points, to ensure key risks are considered and mitigated before work commences. These include commercial, safety, environmental, design, and construction risks.



- Engage suppliers early: this will help drive demand for alternative materials however always be mindful of available supply.
- Temporary works are a great opportunity: workability and performance testing can take place in low-risk environments. Work with the site teams to identify suitable areas where new materials can be tested.
- Sustainable materials don't need to cost more: Suppliers are often willing to supply the material at a neutral cost if research and development benefits are involved, with cost likely to be reduced as quantities increase.
- Provide training: to ensure the design and construction teams are provided with sufficient training and understanding of the triple bottom line benefits of the new material. This will ultimately drive implementation.
- Familiarise teams with the product: Improper experience can result in a poor concrete finish (fibres extruding through surface). This was the case with the Project's initial implementation at the temporary construction gate. Familiarisation resulted in a smooth finish in the subsequent implementation.
- Avoid the paper straw effect: Understand the technical specifications and any possible limitations of the alternative material (including workability and durability); don't support an alternative product that underperforms.
- Be the conduit between teams wherever possible: drive proactive change by acting as a conduit between Design, Quality and Construction teams to drive proactive change. The only task more difficult in construction than a post-IFC design change is an amendment to a specification, or the development of a project specific specification.
- Don't reinvent the wheel: Leverage from technical knowledge of, and lessons learnt from, industry partners to develop a robust plan of implementation.

This case study provides technical data and proof of concept, within the construction window, of the innovations being trialled. The positive results will hopefully lead to a wider acceptance of low carbon concrete mixes in NSW Government infrastructure projects and contribute to a more sustainable future for our industry.

Fibercon: eMesh concrete steel mesh replacement

Infrastructure Sustainability Rating

#Innovation and knowledge sharing #Low carbon, low energy use economy #Healthy, inclusive workforce



Shared user paths

100% RECYCLED MACRO SYNTHETIC FIBRE CONCRETE MESH

North Western Program Alliance are now treating eMesh as the 'BAU' for upcoming level crossing removal projects.

Shared user paths

eMesh 100% recycled macro synthetic fibre, made in Ballarat, packaged by National Disability Insurance Scheme (NDIS) workers, was proposed to replace steel mesh reinforcement in the concrete shared user paths (SUPs) and footpaths by North Western Program Alliance (NWPA) for the Bell to Moreland Level Crossing Removal Project (B2M LXRP).

Reductions in CO2 and PO4 emissions were more than 90% achieved, water and fossil fuel consumption were more than 90% reduced and 200 hours of NDIS employment were created by replacing steel mesh with eMesh, encouraging a deeper examination of other associated benefits, indirect savings and efficiencies of eMesh by NWPA. Areas examined included site activities and compliance, which outlined reduced safety risks on site to workers, time lost due to coordinating, moving and unloading steel mesh deliveries, and reduced pre-pour engineering inspection requirements for eMesh reinforced concrete (no steel mesh to inspect).

The savings across these many areas, which are complemented by site efficiencies and time reduction in construction, provided a clear positive outcome for the decision to adopt the use of eMesh by Major Road Projects Victoria (MRPV) and Rail Projects Victoria (RPV) for future works, with potential for greater improvements across many of the Big Build projects. The potential emission reductions and reuse of waste plastic across future projects, since successful implementation at B2M, is extensive and will provide long term repurposing of a waste stream.

The process to have eMesh approved for use on the B2M project began in late 2019 and early 2020, where, after consultation, design checks, environmental assessment and inspection of existing SUPs at Skeleton Creek (Hobsons Bay, constructed in 2017), a decision was made by NWPA to present a proposal to Metro Trains Melbourne and the Level Crossing Removal Authority for use of eMesh. The proposal was accepted and eMesh was implemented into the project.

Throughout the approval process, which took more than 6 months, and then implementation, there were clear learnings that to introduce a product that is non-standard, the assessment process needs to be clear and concise, backed by evidence and published research. The practical implementation also requires engagement with all levels down to the subcontractor on site. Clear knowledge sharing around how to use, design with and environmentally assess the new product is a key part of success, and B2M showed us this needs to be a strong focus. For future projects, the engagement of all parties, from concrete suppliers to contractors placing the concrete, is paramount to continued improvement and achieving quality outcomes. Lessons learned are already being implemented across many LXRP, MRPV and RPV projects and will continue to be shared to create continued improvements and quality outcomes.

Bluescope Steel: ResponsibleSteel™ Standard and Certification program

#Responsible, agile supply chain #Sustainabilty-aligned governance

BROADER SUSTAINABILITY OUTCOMES IN STEEL SOURCING

The new steel Standard takes a holistic approach to responsible sourcing.

Port Kembla Steelworks (NSW) is BlueScope's only steelworks in Australia. Certification of the Port Kembla Steelworks will have a national impact in that all steel manufactured in the Steelworks will come from a ResponsibleSteel™ certified site.

ResponsibleSteel™ is the steel industry's first global multi-stakeholder standard and certification initiative. It aims to ensure businesses and consumers can be confident that the steel they use has been sourced and produced responsibly at every stage. The Infrastructure Sustainability Council has recently become an Associate Member of ResponsibleSteel™.

The ResponsibleSteel™ Site Standard is live, with a number of steelmakers having made commitments regarding certification, and the first sites in Europe achieving certification in July 2021.

BlueScope is seeking ResponsibleSteel™ certification for its Port Kembla Steelworks by December 2021, with the audit process well underway. Certification to the Standard aligns with BlueScope's broader sustainability outcomes including climate action, that includes the organisation's 2050 net zero goal, responsible products and supply chains and strong communities.

The ResponsibleSteel™ Site Standard takes a holistic approach to responsible sourcing, covering 12 Guiding Principles. These include climate change and GHG emissions, water stewardship, biodiversity, occupational health and safety, human rights and labour rights. Steel manufacturers are audited against these principles by third party auditors. The audit findings are reviewed by an independent Assurance Panel ahead of certification being awarded. Key stakeholder groups, including employees and community groups, are interviewed as part of the audit process.

A second tier of the Standard, for the certification of the steel itself, will build on the existing Site Standard. This Standard sets out more detailed requirements for steelmakers in the areas of GHG emissions and the sourcing of input materials. The ResponsibleSteel™ Steel Standard will be launched in late 2021.

One of the strengths of ResponsibleSteel™ is its multi-stakeholder approach. Along with BlueScope, large steel manufacturers including ArcelorMittal and Tata Steel are ResponsibleSteel™ members. Broader steel value chain members include BHP, Anglo American, Lendlease, BMW and HSBC. Civil Society Members such as CDP, The Climate Group and Mighty Earth ensure that the Standard is robust and Associate Members such as the Infrastructure Sustainability Council, the Green Building Council of Australia and the Australian Supply Chain Sustainability School aim to facilitate its adoption in industry through platforms such as IS Rating and Green Star.

ResponsibleSteel™ brings a much-needed credible label to the building industry for the responsible sourcing and production of steel. It provides a simple and robust framework for stakeholders in the steel value chain to meet their climate change and broader sustainability objectives as well as manage risk in their supply chains.

Transport for NSW: Mindyarra Regional Rail Maintenance Centre

#Healthy, inclusive workforce #Low carbon, low energy use economy
#Liveable communities

NEW BEGINNINGS AT MINDYARRA

Aboriginal participation is a key focus for this project.

Regional Rail are replacing the ageing NSW rail fleet with new state-of-the art trains. To support the new fleet, a purpose built maintenance centre is being constructed in Dubbo in a project committed to delivering sustainable jobs for a diverse workforce.

New beginnings for a regional workforce

Transport for NSW needed to replace their aging regional fleet of XPT, XPLORER and Endeavour trains as deterioration in fleet's condition was causing poor and declining customer experiences and reduced reliability and availability. A new fleet of 29 trains will provide improved safety, accessibility, facilities and reliability for customers who travel from many NSW regional centres to Sydney, as well as to Canberra, Melbourne and Brisbane.

To support the new fleet, a Regional Rail Maintenance Centre is being built in Dubbo, named Mindyarra, a Wiradjuri word meaning to fix or repair, which was chosen in collaboration with representatives from many local Aboriginal organisations.

A key objective of the Regional Rail project is to provide opportunities for people and businesses in regional NSW. A Jobs, Skills and Industry Participation team on the project is focused specifically on delivering against this objective. The Regional Rail project will stimulate the regional economy and help create sustainable job opportunities and develop local skills.

- An estimated 200 jobs will be required during construction of the maintenance centre. Employment pathways development includes creating roles for apprentices, trainees, graduate placements and work experience on the project. Skills will be transferable between project phases and onto other projects in the region, supporting long term job prospects for regionally-based people.
- The operation of the maintenance centre will require 50 jobs, providing opportunities for long term employment and skills development.

Aboriginal participation is a key focus for this project, including providing opportunities for, and building the capabilities of, Aboriginal businesses. Job creation will also target women in non-traditional trades and young people under 25 years of age.

A Jobs, Skills & Industry Participation Advisory Group and an Aboriginal Working Group was established in 2018 and includes representatives from Federal, State and local government. These groups provide advice and support to Transport for NSW to help deliver the priorities and objectives. The Aboriginal Working Group members have links to the local Aboriginal community in and around Dubbo, and focus on achieving meaningful outcomes for Aboriginal peoples. Overall, the project is exceeding a number of its Aboriginal participation requirements. As of June 2021, 57% of the project's apprentices and 19% of level 1 supervisor and above positions were held by Aboriginal people, exceeding targets of 10% and 5% respectively.

Five major packages for the Mindyarra Maintenance Centre have been awarded to an Aboriginal business building a local presence, including recruiting electrician and trade assistant roles locally. In total, 18 Aboriginal businesses have been engaged on the project to date.

Transitioning to a lower carbon, less polluted future

The Mindyarra Maintenance Centre will feature several sustainable operational solutions. It will generate at least 95% of its low voltage power needs from onsite solar technology. Operational water demands, including train wash, irrigation and other uses, will be supplied by captured rainwater, bore water and recycled water wherever possible, reducing demands on potable water supply in the Dubbo area.



Regional Rail new fleet

Land use change is minimised as the site was previously used for rail activities and stockpiling, which provided limited habitat, so the design is not expected to have a significant impact on animal species. Any removal of vegetation from the site will be offset in accordance with the Transport for NSW Vegetation Offset Guide.

We are introducing bi-mode technology to the Regional Rail fleet (these will be the first trains in Australia to use this technology) to significantly reduce carbon emissions and diesel particulates compared with the current fleet. Bi-mode is a diesel-electric hybrid which will allow the fleet to run on overhead power when operating on the electrified train network, and the train will use on-board diesel engines only when operating outside of the electrified network. This will reduce carbon emissions by more than 540 tonnes and diesel pollution by around 3 tonnes annually, and will save more than AU$2 million in annual fuel costs. Reducing particulate matter associated with diesel engines, the bi-mode technology should also improve localised air pollution.

INDUSTRY

CRL:
City Rail Link project

#Healthy, inclusive workforce #Circular economy
#Engaged people and communities

Infrastructure Sustainability Rating
Design LEADING
Design LEADING
As Built EXCELLENT

JOINING THE DOTS IN AUCKLAND CITY

Commitment has been turned into action.

At NZ$4.4 billion, City Rail Link project is the largest single transport infrastructure project undertaken in New Zealand and the foremost transformational project in the next decade for New Zealand's largest city. It 'joins the dots', connecting the existing dead-end main station at Britomart in downtown Auckland with suburban Mt Eden Station. Once completed, it will double Auckland's rail capacity and double the number of Aucklanders within 30 minutes of the central city, making it easier for people to access employment and lifestyle choices in the central city and suburbs, while boosting productivity and prosperity for a growing and vibrant Auckland and providing an environmentally cleaner travel option than cars. At peak construction CRL will employ more than 2,000 people. The project's scale and complexity will upskill the workforce, providing a lasting benefit for the long-term development of New Zealand.

Our commitment to mana whenua – guardians of the land

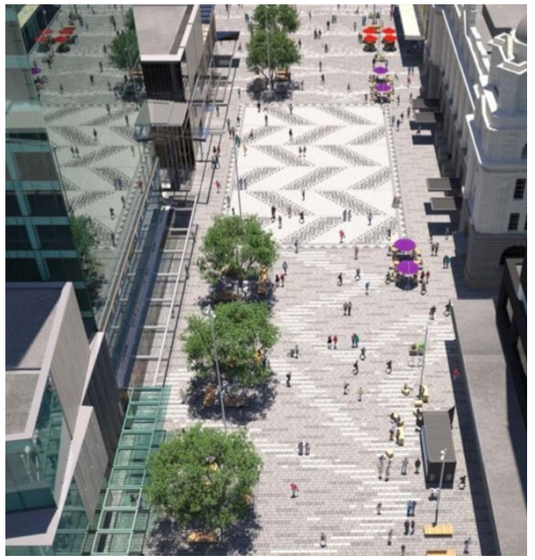
Auckland has the highest population of Māori and Pasifika in New Zealand, and this population is youthful. Right from the get-go, CRL has been inspired to deliver construction in a way that creates lasting and positive benefits for these communities. This commitment is anchored in a long-standing and positive partnership with eight Auckland iwi represented on CRL's Mana Whenua Forum. The Forum developed Mahi Rauora Aratohu (guidance for the work on the health of all things) – a world-first ISC infrastructure sustainability manual – which ensures that CRL's outcomes are compatible with te ao Māori (the Māori worldview).

Putting this guidance into practice:

- Outside the Britomart Station a traffic-clogged street is now a people-friendly pedestrian square known as Te Komititanga – a name gifted by iwi, which means to mix or merge. The square's basalt pavers represent traditional Māori design.
- Inside CRL, nine young Māori and Pasifika men and women have found jobs through the project's Progressive Employment Programme (PEP). This 16-week programme runs twice yearly, and provides onsite practical experience and training in a variety of jobs supported offsite by lifestyle mentoring. CRL believes PEP creates long lasting social impacts through investment in an intern's future, their family, their community and in a country spending heavily on large-scale infrastructure projects.
- CRL's objectives extend into the project's supply chain. Sixteen Māori and Pasifika-owned businesses have secured contracts with the project's leading contractor, the Link Alliance. About 4% of Link Alliance spend to date is committed to Māori and Pasifika-owned sub-contractors and suppliers.
- CRL contractors are expected to engage with Māori, Pasifika and youth with employment opportunities, and ensure a diverse and inclusive workforce. CRL objectives are built into contracts and monitored regularly.

Our commitment to a low carbon future

The completed City Rail Link will be a low-carbon travel option. However, there is a significant up-front carbon cost to construct, both in energy-related GHG emissions and the embodied carbon of materials used. Concrete and steel, the two most common materials used by CRL, contain high levels of embodied carbon. They also provide the greatest opportunity to reduce the embodied carbon footprint. The Link Alliance, responsible for the substantive tunnels/stations contract, relies on high-tech computer technology to achieve its target of a 15% reduction. Its use of 3D Building Information Modelling (BIM) provides regular and accurate measures of embodied carbon estimated in the original Base Case and the measures used in the final design. BIM provides opportunity for design changes to facilitate the best build and the latest modelling estimates a 17% reduction of the materials carbon footprint compared to the Base Case.





Concept visualisations of Te Komititanga Square, Britomart Station (City Rail Link Ltd (cityraillink.co.nz))

INDUSTRY

Our commitment to a circular economy

CRL is playing a leadership role in diverting construction and demolition waste from landfill and reusing materials, with:

- 40,583 tonnes of CRL construction and demolition waste diverted from landfill
- 99% of all project waste, including spoil, diverted
- 5,449 tonnes of waste reused
- 2,601 m3 of water reused on site

CRL and The Link Alliance can proudly illustrate other examples of where commitment has been turned into action: a 19th century pioneer cottage facing demolition at the Mt Eden construction site was trucked to an historic village 75 kilometres away; a café/bar in the middle of the Karangahape site was dismantled section-by-section and shipped to the remote Pacific island of Niue; and a Pasifika-owned salvage company stripped thousands of items from around 40 commercial buildings being demolished at Mt Eden for reuse both in New Zealand and the Kingdom of Tonga.

Our IS Rating

CRL construction continues at pace, but already its pledge to be an industry leader for project sustainability is recognised by the ISC:

- Leading Design Rating - CRL Contract 1
- Leading Design Rating - CRL Contract 2
- Excellent As-Built Rating - CRL Contract 2
- Targeting Excellent - CRL Contract 3

CRL believes the project's challenge is not to lose sight of what it has already achieved and to focus on what remains to be accomplished to realise its objectives.

Industry Outlook

In Australia and Aotearoa New Zealand, infrastructure assets serve nearly 31 million people, providing energy, transport, three waters, waste, social, connectivity and recreational functionality. That is what infrastructure does, but that is not what it is for. Infrastructure enables lifestyles, protects communities and supports economies. Indicators of success aren't kilometres of road or numbers of users, but the development of society and stewardship of the environment for future generations.

This report has been a peek over the horizon at the future of sustainability practices in the infrastructure sector. In the near future, organisations will pay attention to not only the immediate effects of what they are doing, but how the effects of their actions are actually experienced over time by the environment, society, the economy and the industry itself. Progressive organisations, many of which are in our membership, have already begun to expand their perspective on what performance really means, from considering what their organisation can achieve in pursuit of internally-set, somewhat incremental outcome targets to considering how to mould their business model to effectively address wicked problems through an understanding of external needs, thresholds and tolerances.

We asked the leaders of our industry partners for their thoughts on how and why the sector must adopt an impact-focused outlook. We think their words are grounds for optimism, and a clear signal to roll up our sleeves to build the future we all want.

'With the impact of the COVID-19 pandemic and natural disasters comes greater societal concerns about protecting physical and mental health, increasing resilience, and improving quality of life. Our industry is an advocate for the upfront identification and measurement of social and environmental value to guide investment and project decisions. By using sustainable principles in the scope and design of projects, we can consider the needs of our communities and future generations to shape lasting legacies, working with and not against our environment.'

Nicola Grayson, Chief Executive Officer, Consult Australia

'It is critical to the wellbeing of people and communities that infrastructure is shaped in such a way as to represent the needs and aspirations of those served by it. The infrastructure sector therefore stands central to building social cohesion and addressing structural inequities that have caused historical harm and disadvantage. Increasingly, we see that sustainability programmes recognise the people element as of equal importance to the planet element.'

Maretha Smit, Chief Executive, Diversity Works New Zealand

'Our infrastructure connects our communities and underpins our productivity. In the short term, there are opportunities to adapt existing assets in response to the pressures of population, usage and unprecedented weather events. However, industry must also consider the whole-of life-asset costs, risks and benefits; and ensure project planning is supported by best practice governance, engagement and data-driven decision making. Embedding resilience and sustainability principles in design and targeted investment in research and development to support the application of innovative and new technologies will limit the impacts of future challenges. Spending now to save later will ensure greater efficiency, safety, resilience and productivity for the benefit of our communities, the environment and the economy.'

Dr Bronwyn Evans AM, CEO, Engineers Australia

'Construction performs a key role in shaping societies and economies and our industry is well placed to help enable the transition to a Net Zero future. We are in a unique position to influence emissions reductions through low emission construction processes, materials and transportation, and respond to policy incentives from government, proponents and asset owners.'

Jon Davies, CEO, Australian Constructors Association

'With the latest IPCC report highlighting the threats our communities face with climate change, it is clear we need to take meaningful action to decarbonise. ASBEC recognises the challenges and opportunities ahead as we reshape our infrastructure for a Net Zero emissions world. Good infrastructure decisions made now for the long term will play a significant role in emission reductions, helping protect the future for millions of Australians. Rising to the challenge is a shared responsibility between all stakeholders across the infrastructure lifecycle, and ASBEC looks forward to working with the sector to make this Net Zero vision a reality.'

Alison Scotland, Interim Executive Director, Australian Sustainable Built Environment Council

'While our industry adopts environmental, social and governance as a normal part of business, we're also staring down one of the biggest infrastructure pipelines we've ever seen. This presents a unique opportunity to deliver future-ready buildings and places that both meet our present needs and community expectation to act on climate.'

Davina Rooney, CEO, Green Building Council of Australia

'We now see sustainability at the centre of infrastructure conversations, particularly as investors apply a risk lens to carbon intensity and climate resilience. I'd love to say this is altruism at work, but it's actually driven by dollars - and that's a good thing. We should embrace that alignment and use it to drive a deeper and more sustainable impact.'

Adrian Dwyer, CEO, Infrastructure Partnerships Australia

'More and more, the community expects to see sustainability embedded in the products and services they use – and integrated transport infrastructure is no different. Roads Australia is proud to be facilitating collaboration between industry sectors and governments that will lead to greater uptake of more environmentally sustainable materials, procurement practices and vehicles across our transport networks. Roads Australia is working with ARRB and Austroads to showcase examples of best practice and highlight innovation, and partnering with the Australasian Railway Association and the Infrastructure Sustainability Council to demonstrate that our sector is proactively working to make a difference.'

Michael Kilgariff, CEO, Roads Australia



Developing sustainable and resilient infrastructure

The ongoing COVID pandemic has brought the importance of developing sustainable and resilient infrastructure to the fore.

Australia's states and territories are ramping up emissions reduction commitments amid strong investment in infrastructure in response to the fundamental change in the way people live and work, while New Zealand is legislating mandatory climate risk reporting.

Projects developed today will exist beyond the 2050 deadline to transition to Net Zero carbon. It is therefore vital to embed resilience and carbon reduction into the design, delivery and operation of infrastructure projects.

At ANZ, we understand this. We provide a variety of funding options to infrastructure projects that aim to deliver sustainable outcomes in the energy, waste, water, transport, telecommunications and property sectors. Green, social and sustainable bonds and loans are accessible to companies and projects that can demonstrate leading sustainability credentials, such as an IS Rating.

Talk to us today about the variety of options available to align a project's cost of capital with strategic sustainability goals. Let's work together to build a Net Zero carbon future.





04 Appendices

IS Rating Awards FY21

RATING TOOL	AWARD	PHASE	ASSET	REGION	PROJECT	SIGNIFICANT INNOVATIONS
ISv2.0	Silver	Planning	Road	WA	Bunbury Outer Ring Road	
	Gold	Design	Road	SA	North-South Corridor – Regency Road to Pym Street v2.0	1 Region First
ISv1.2	Leading	Design	Parks	NZ	Scott Point Sustainable Sports Park	
			Rail	NSW	New Intercity Fleet Maintenance Facility	
			Road	NSW	Westconnex M4-M5 Link Tunnels	1 Nation First
				QLD	M1 Pacific Motorway Upgrade Varsity Lakes to Burleigh	2 Nation First
			Water	NZ	Central Interceptor	1 World First 3 Nation First
		As Built	Rail	NSW	CBD South-East Light Rail	4 Nation First
				NSW	Transport Access Program 3 (TAP3) – Wyee and Waratah Stations	
				VIC	Ballarat Line Upgrade	1 Nation First
				VIC	LXRP Package 4 – CD9 Caulfield to Dandenong	
				VIC	LXRP NWPA – High Street Reservoir	4 Region First
			Road	NSW	Westconnex - New M5 Main Works (Stage 2)	1 World First 1 Nation First
				VIC	LXRP WPA – Aviation Road & Wyndham Vale Stabling	2 Nation First 4 Region First
	Excellent	Design	Rail	NSW	Narrabri to North Star (Inland Rail)	1 Nation First
			Road	QLD	Bruce Highway Interchange Upgrades – Maroochydore Rd & Mons Road	2 Region First
				QLD	Bruce Highway Upgrade (Caboolture to Steve Irvin Way)	
				QLD	Haughton River Floodplain Upgrade	
				WA	Great Northern Highway: Muchea to Wubin	
			Waters	ACT	ACT Healthy Waterways	
		As Built	Rail	NSW	Newcastle Light Rail	1 Nation First
			Road	NSW	NorthConnex	
				QLD	Pacific Motorway Upgrade – M1/M3/ Gateway Merge	
		Operations	Road	TAS	Tasmanian Northwest Road Ops	
	Commended	Design	Road	VIC	Western Roads Upgrade	
		Operations	Road	VIC	Western Roads Upgrade Operations	1 Region First

IS Rating Tool ISv2.1

Themes	Category	Code	Credit
GOVERNANCE	Place	Pla-1	Strategic Context (Planning only)
		Pla-2	Urban and Landscape Design
	Leadership and Management	Lea-1	Integrating Sustainability
		Lea-2	Risks and Opportunities
		Lea-3	Knowledge Sharing
	Sustainable Procurement	Spr-1	Sustainable Procurement Strategy
		Spr-2	Supplier Assessment and Selection
		Spr-3	Contract and Supplier Management
	Resilience	Res-1	Climate and Natural Hazards Risks
		Res-2	Resilience Planning
	Innovation	Inn-1	Innovation
ECONOMIC	Options Assessment	Ecn-1	Options Assessment and Significant Decisions
		Ecn-2	Valuing and Considering Externalities (Planning only)
		Ecn-3	Equity and Distributional Impacts (Planning only)
	Benefits	Ecn-4	Benefits Mapping
		Ecn-5	Post Project Evaluation (Operations only)
ENVIRONMENT	Energy and Carbon	Ene-1	Energy Efficiency and Carbon Reductions
		Ene-2	Renewable Energy
		Ene-3	Offsetting
	Environmental Impacts	Env-1	Receiving Water Quality
		Env-2	Noise
		Env-3	Vibration
		Env-4	Air Quality
		Env-5	Light Pollution
	Resource Efficiency and Management	Rso-1	Resource Strategy Development
		Rso-2	Management of Contaminated Material
		Rso-3	Management of Acid Sulfate Soil
		Rso-4	Resource Recovery and Management
		Rso-5	Adaptability and End of Life
		Rso-6	Material Life Cycle Impact Measurement and Management
		Rso-7	Sustainability Labelled Products and Supply Chains
	Water	Wat-1	Avoiding Water Use
		Wat-2	Appropriate Use of Water Sources
	Ecology	Eco-1	Ecological Protection and Enhancement
SOCIAL	Stakeholder Engagement	Sta-1	Stakeholder Engagement Strategy
		Sta-2	Stakeholder Engagement and Impacts
	Legacy	Leg-1	Leaving a Lasting Legacy
	Heritage	Her-1	Heritage Protection and Enhancement
	Workforce Sustainability	Wfs-1	Jobs, Skills and Workforce Planning
		Wfs-2	Workplace Culture and Wellbeing
		Wfs-3	Diversity and Inclusion
		Wfs-4	Sustainable Site Facilities

ISC Members

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Alstom Australia
ANZ
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Arnowa
Arrilla
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Ash Development Association of Australia
Auckland Council
Auckland Transport
Aurecon
AusNet
Aussie Industries
Australasian (Iron & Steel) Slag Association
Australasian Certification Authority for Reinforcing and Structural Steels
Australasian Railways Association
Australian Flexible Pavement Association
Australian Rail Track Corporation
Australian Road Research Board
Australian Society for Concrete Pavements
Autodesk
AW Edwards
BarChip
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Department of Environment, Land, Water and Planning Victoria
Department of Infrastructure and Transport SA
Department of Planning, Industry & Environment NSW
Department of Transport & Main Roads QLD
Department of Transport Victoria
Diona
Diversity Works New Zealand
DLCM
DLPA
Downer
Dumpit Bins
Earthing Solutions
Echo Barrier Australia
Eco Origin
Edge Environment
Emesh by Fibercon
Energetics
Energy Estate
Enosi Australia
Environmental Earth Sciences International
Envirosuite Operations
Etool
FCC Construction
Fencepac Barriers
Ferrovial
Ferrycarrig Construction
Fletcher Construction Company
Fortis Group
Fresh Start Australia
Frontier Economics
Fulton Hogan Australia
Future Eye
GPP Recycling
Galvanizers Association of Australia
Gamuda
GartnerRose
GEA Environmental
Geofabrics
GHD
Global Green Tag
GM Road & Civil Group
Good Environmental Choice Australia
Grasshopper Environmental
Green Business
Hanson Australia
Harrison Grierson
HEB Construction
HL Landscapes
Holcim Australia
Huesker Australia
HW Ebsworth
Hydropoint
Indigeco
Infrabuild
Infrastructure New Zealand
Inxure Consulting
Jacobs Group
John Holland Group
JWA Oilfield Suppliers
Kingfield Galvanising
KiwiRail
KPMG
Kullcorp
Laing O'Rourke
Lendlease
Level Crossing Removal Authority
Losee Consulting
Main Roads Western Australia
Major Roads Projects Authority Victoria
Major Transport Infrastructure Agency
Malo Sustainability Consulting
Maxen
McConnell Dowell Constructors
Metronet
MG Solutions
MinterEllisonRuddWatts
MMS Group
MolinoCahill Lawyers
Mott MacDonald
Nation Partners
NDEVR Environment
Waka Kotahi New Zealand Transport Agency
Norris Construction Group
North East Link Authority
Outlook
Parkes Shire Council
Patriot Environmental Management
Pendoley
Perspektiv
Pillar Two
Plastics Industry Pipe Association
Ports of Auckland
Qube Logistics
Queanbeyan-Palerang Regional Council
Rail Projects Victoria
Red Fox Advisory
Red Tree Environmental Solutions
Refugee Talent
Repurpose It
ResourceCo
RMIT University
RPS Group
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Senscity
Seymour Whyte Constructions
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SMEC
Social Traders
SoilCyclers
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State Asphalts NSW
Sustainability Victoria
Sustainable Asset Strategies
Sustainable Built Environment National Research Centre
Syrinx Environmental
Tactical Group
Texcel
The Environmental Factor
The Sustainable Engineering Society
Thinkstepanz
Tonkin & Taylor
Townley's Environment Services
Track Protection Australia
Transdev Australasia
Transport for NSW
Transurban Group
UGL
Upthink
Ventia Australia
Victory Flag Services
Virid IFC
Viridis Australasia
Vital Chemical / Vital Environment
Watercare
WBHO Australia
Webuild
Wolf Peak
WSP
Xypex

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