Downer

Shaping the future of rail & transit systems | Passenger and freight | Digital & robotics platform | Make the difference that matters

FEATURE

Future Fleet, Made Local

Global technology.
Local capability.
Lasting impact.

QUEENSLAND EDITION

Insights



$9.8B Revenue

22,800 Employees

~17,000 Suppliers and subcontractors

$6.0b FY26 supply chain spend

500+ Operating sites

Source: Downer Group FY26 Annual Report

Delivering essential infrastructure across Australia & New Zealand

About Downer

Downer EDI Limited (Downer) is a leading provider of integrated services across Australia and New Zealand, delivering and maintaining essential infrastructure that enables communities to thrive.

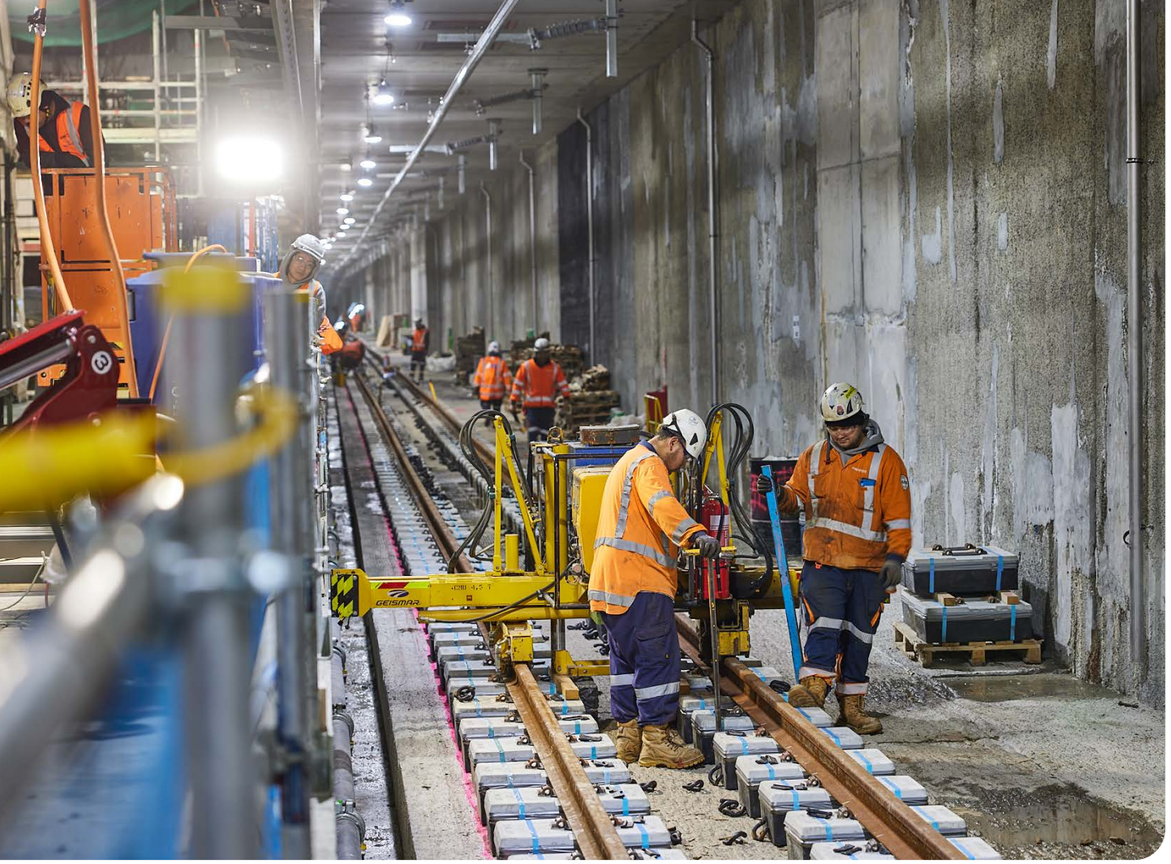
The demand for our services is shaped by investment in the energy transition, defence capability, government services and infrastructure expansion necessary to support population growth, and local industry revitalisation.

The sectors where we operate include roads, rail, ports and airports, power, gas, water, telecommunications, energy networks, health, education, defence, and other government sectors.

Downer is one of Australia's and New Zealand's largest private sector employers, with approximately 22,800 people, who are united by our high-performance culture, known as 'The Downer Difference'.

For more information visit **downergroup.com**





City Rail Link, New Zealand

Preface

Downer is a leading provider of integrated infrastructure services across Australia and New Zealand. We are committed to building strong relationships with our customers, people and communities. Together, we enable communities to thrive, shaping a connected and sustainable future. Our ambition is to build a world where resilient infrastructure enhances liveability, connects us and unlocks our potential. As our communities grow, so too does demand for greater urbanisation and productivity. This places pressure on our environment, so we're innovating to support a better climate future. We strive to be the most collaborative and sustainable engineering, infrastructure management and construction services provider in Australia and New Zealand. We seek to employ the best people and bring thought leadership to each stage of the asset lifecycle as we support our customers to plan, create and sustain. We use our strength in relationships, depth of talent and passion for innovation to make an enduring, positive impact on the communities we serve. We deliver greater value for our partners and contribute meaningfully to communities while actively supporting our environment.

Together, we enable communities to thrive

Foreword

Stephen Kakavas

CHIEF OPERATING OFFICER
Downer Rail & Transit Systems

The most transformative developments in transport today sit at the intersection of engineering, technology and people.

Across Australia and New Zealand, our customers are looking for practical ways to improve reliability, extend asset life, enhance sustainability outcomes and make better use of data and technology. At the same time, our industry is investing in the partnerships, innovation and skills needed to meet the demands of the future.

The most transformative developments in transport today sit at the intersection of engineering, technology and people.

Across Australia and New Zealand, our customers are looking for practical ways to improve reliability, extend asset life, enhance sustainability outcomes and make better use of data and technology. Meeting these challenges requires strong partnerships, innovation and the skills to deliver.

These priorities are particularly relevant in Queensland, where continued investment in transport infrastructure is creating opportunities to strengthen local capability and deliver increasingly complex projects.

For Downer, that means investing in sovereign advanced manufacturing, local supply chains and the skills our industry needs for the future. It also means working closely with customers to understand their challenges, co-create solutions and find better ways to deliver, bringing together engineering, technology and practical experience.

Our Rail & Transit Systems team are building on our experience delivering and maintaining critical rail and transit assets and infrastructure in Australasia. Today, we combine engineering and operational expertise with digital capability, innovation and strategic partnerships to solve complex challenges and improve the performance of the assets and networks our customers rely on.

Across Maryborough, Torbanlea and Ormeau, we bring together advanced manufacturing, engineering, technology and through-life asset management, with the experience to deliver complex projects in live operational environments.

Our connection to Queensland rail goes back more than 160 years. In 1873, the Mary Ann, Queensland's first steam locomotive, was built in Maryborough, beginning a manufacturing legacy that continues today. More broadly, over 4,000 Downer people in Queensland support the infrastructure and services communities rely on every day.

As Queensland looks towards 2032 and beyond, our focus is firmly on the future: investing in local jobs and skills, strengthening sovereign capability, innovating alongside our customers and partners, and delivering the transport infrastructure Queensland will need for the future.



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Section 1

We are partners, technology integrators, problem solvers and community builders.

From first concept through to operation, we design, build, maintain and optimise Australia and New Zealand's most complex passenger and freight rollingstock, transit systems and supporting infrastructure.

155 years of rail experience. Local jobs, local skills, local supply chains.

We combine global technology with sovereign expertise to keep transport networks running safely, efficiently and sustainably - not just at handover, but decades on.





Shaping the future of rail & transit systems



What people know us for

For more than 160 years, Downer has helped shape rail and transit networks across Australia and New Zealand.

Many know us for the trains we build, maintain and modernise.

For major passenger fleets.

For freight rollingstock.

For manufacturing, maintenance and asset management.

And they're right.

These capabilities remain the foundation of Australasia's leading rail and transit business.

2,000+
rollingstock units **maintained**

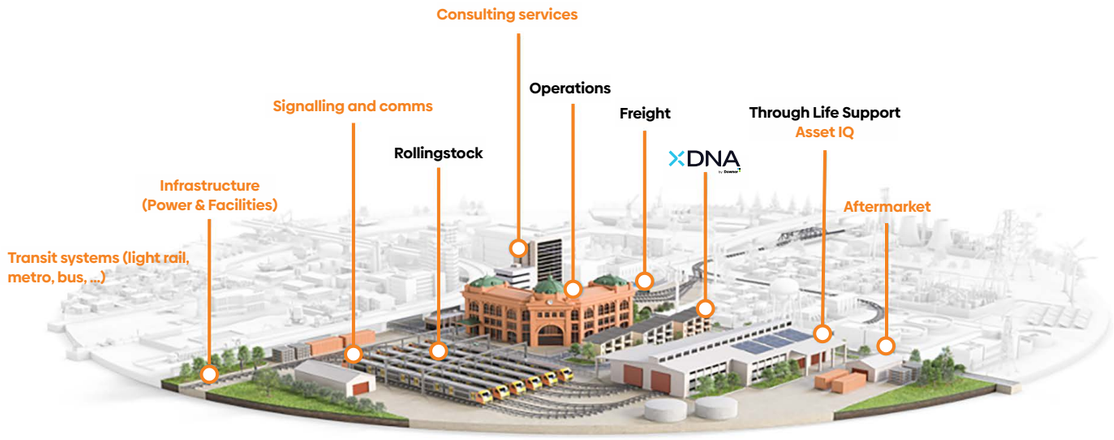
3,000+
rollingstock units **overhauled**

3,000+
rollingstock units **built**

Operations across Australia and New Zealand

Auburn Maintenance Centre, New South Wales





The next evolution of Downer Rail & Transit Systems

From rail assets to transport outcomes

Rail is becoming increasingly connected.

Rollingstock. Infrastructure. Signalling. Operations. Data. Energy. Passenger experience.

Success depends on more than individual assets.

It depends on how effectively they work together.

Today, Downer Rail & Transit Systems brings together the capabilities required to ideate, design, integrate, deliver, operate and maintain complex transport systems across their full lifecycle.

As a trusted partner to transport authorities, operators and freight customers, we combine expertise in engineering, manufacturing, consulting, operations, asset management and digital solutions to solve increasingly complex transport challenges.

Our consulting, signalling, infrastructure, operational and digital capabilities have been built from decades of experience operating, maintaining and improving real-world transport systems. This practical foundation allows us to turn emerging technologies, data and AI-driven insights into solutions that improve performance, reliability and customer outcomes.

Working alongside trusted global partners, we connect world-class technology with sovereign capability, local knowledge, skilled people and resilient supply chains to deliver practical solutions that create lasting value.

We are technology integrators.

We are problem solvers.

We are community builders.

Helping shape the future of transport across Australia and New Zealand.

Creating the capability behind Australia's rail future

Australia's rail future depends on more than rollingstock. It depends on skilled workers, resilient supply chains, advanced manufacturing capability and the confidence to invest for the long term.

Programs such as the Queensland Train Manufacturing Program demonstrate what is possible when governments, industry and suppliers work together around a shared objective: building capability that lasts beyond a single project.

Through the Queensland Train Manufacturing Program, Downer is delivering 65 six-car passenger trains, a purpose-built manufacturing facility at Torbanlea in the Fraser Coast region and a new rail facility at Ormeau on the Gold Coast. The program enhances local industry participation, supports regional employment and creates long-term capability for Queensland's rail sector.

"That outcome doesn't happen by itself. Our role has been to stand up the capability, build the manufacturing base, engage the supply chain early and bring local suppliers into the core of delivery".



Martin Loh

HEAD OF PROCUREMENT & SUPPLY CHAIN

More than manufacturing. We're building sovereign capability for the long term

The real value of a rail program extends well beyond the fleet itself.

It lies in the capability that remains long after the final train is delivered, the skilled workforce, the local suppliers, the engineering expertise and the industrial capacity that supports future generations of rail investment.

Across Australia, Downer works with ~ 17,000 suppliers and invests approximately $6 billion annually through its supply chain. That scale helps create opportunities for local businesses, strengthens sovereign capability and supports economic activity in regional communities.

For global rail partners, this demonstrates something important: Australia is not simply investing in rollingstock. Australia is continuing to build a rail industry.

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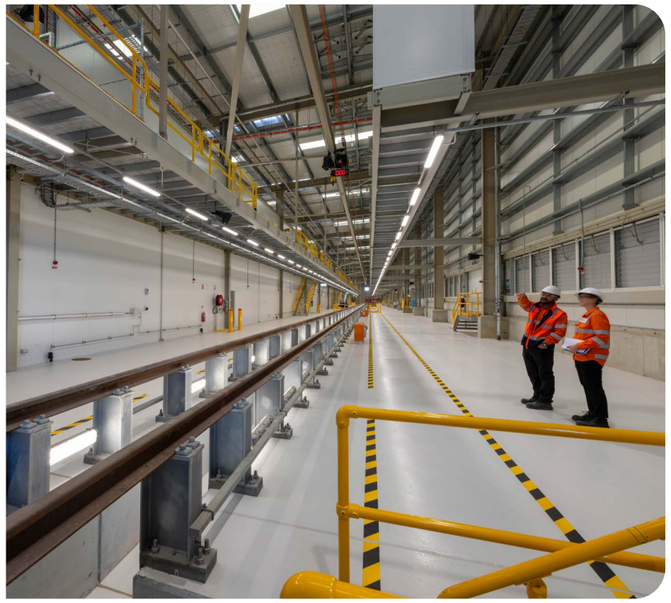
Advanced manufacturing at scale



Torbanlea manufacturing site, Month 2026, Queensland

World-class advanced manufacturing

Australia has the foundations of a world-class rail manufacturing and maintenance sector.

From Maryborough on the Fraser Coast to the Hunter region in New South Wales, significant capability already exists across manufacturing, engineering, overhaul, maintenance and supply chain delivery. These are capabilities developed over decades of investment and project delivery.

The challenge is not whether Australia can build rail capability. The challenge is how we create the continuity of work needed to fully utilise, strengthen and grow it.

For industry, government and suppliers alike, the opportunity is about creating the confidence to invest in facilities, technology, skills and workforce development, knowing there is a sustainable pipeline of future work.

For global rail partners, this creates a compelling proposition: an established rail market with manufacturing capability, lifecycle asset management expertise, experienced suppliers and growing opportunities for collaboration, innovation and deployment.

Torbanlea Manufacturing site, Queensland

Earlier this year, the Minister for Manufacturing, the Hon. Dale Last MP, has cut the ribbon to officially open the Torbanlea train manufacturing facility.

This marked the next phase of the Queensland Train Manufacturing Program (QTMP) with the start of preliminary manufacturing activities. QTMP will build 65 new six-car trains for South East Queensland to support population and economic growth.

Equipped with advanced manufacturing technology, eight dedicated fit-out stations and rigorous testing processes for each of the new train cars, Torbanlea will play a critical role in delivering high quality, locally built trains for South East Queensland. The facility also showcases a strong sustainability focus, featuring solar panels, water treatment and rainwater reuse systems.

Once fully operational, the facility will support nearly 200 blue-collar and 100 white-collar jobs, delivering long-term benefits for the region.

This project celebrates the region's strong rail manufacturing heritage while creating new opportunities for jobs, skills and local supply chains. All 65 new trains are expected to be in service by 2032.

"...the facility will support nearly 200 blue-collar and 100 white-collar jobs"

Scan the QR code for more information about Queensland Train Manufacturing Program.

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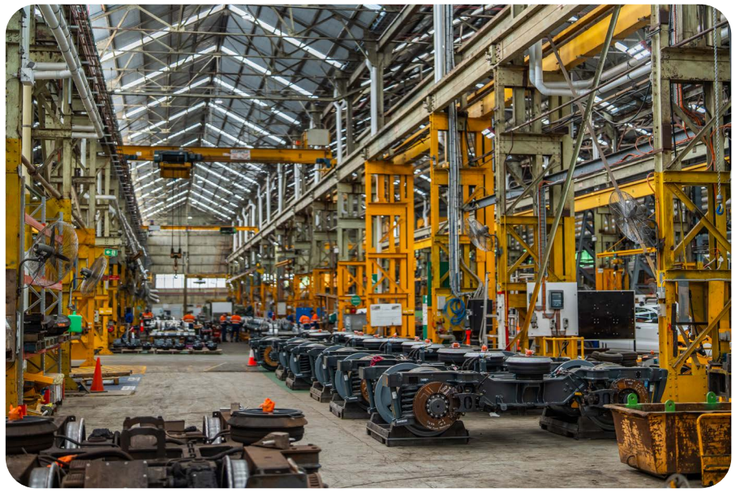
Maryborough Service Delivery Centre (MSDC), Queensland

This is where Downer's rail heritage meets modern engineering capability. Bringing together manufacturing, overhaul, maintenance and asset-life extension services on a single site, MSDC helps operators improve reliability, reduce downtime and maximise asset performance. Backed by more than a century of engineering experience and a highly skilled workforce, the facility plays a vital role in supporting Australia's rail industry while sustaining sovereign capability and regional jobs

- 500+ Locomotives manufactured
- 1,000+ Passenger Cars produced
- 600+ Vehicles overhauled or modified since 2021
- 11 Hectares of integrated manufacturing and overhaul capability
- NATA & ISO Certified quality, safety and testing systems





Downer's Maryborough Service Delivery Centre (MSDC), Queensland



Cardiff Service Delivery Centre, New South Wales

Cardiff Service Delivery Centre, New South Wales

Located in the Hunter region, Cardiff's service delivery centre supports rail maintenance, overhaul and lifecycle asset management activities while sustaining highly skilled rail capability in one of Australia's most important rail industry hubs.

- Sydney's passenger fleet supported through overhaul, refurbishment and fleet sustainment activities
- 55 Tangara Trains being refurbished through the Tangara Fleet Life Extension Program, starting in 2026
- 9,000+ electronic components recovered through our electronic test & repair centre.



Making the Difference in Queensland

Downer delivered Queensland's first-ever locomotive in 1873, and we've been delivering for Queensland ever since.

Our history is deeply rooted in Queensland. Our Maryborough Rail Service Delivery facility has been a key part of the manufacturing industry in Queensland since 1869, and we owe the EDI in our name to the iconic Queensland firm, Evans Deakin Industries, founded in Brisbane more than 100 years ago.

We have proudly worked alongside the Queensland Government for more than 150 years, delivering essential services across the rail, road, water, gas, telco, health, education and defence sectors. And, as Queensland looks to the future with an eye on the 2032 Olympic and Paralympic Games, Downer is committed to continuing our proven partnership.

Downer is uniquely positioned to support the three pillars of the Queensland Government's objectives for the community.

Good jobs: Downer is among Queensland's largest employers, with a workforce of more than 4,000 people in the Sunshine State. Driving opportunities across Queensland's traditional and emerging industries,

Downer helps grow a future-ready workforce. We enable Queensland communities to thrive by creating jobs through infrastructure projects, investing in training and apprenticeships, and growing technical capability across sectors.

Better services: Downer delivers critical public services and infrastructure that underpin health, safety, and community wellbeing. We keep Queensland moving, connected, educated, and safe. From world-class transport networks to frontline service support, Downer's work strengthens public services and ensures essential services reach every community, every day.

Great lifestyle: The services we deliver across the State help safeguard Queensland's unique environment while delivering resilient, sustainable infrastructure. Regional growth, renewable energy solutions, cultural inclusion, and future-focused developments are central to how Downer enables communities to thrive.

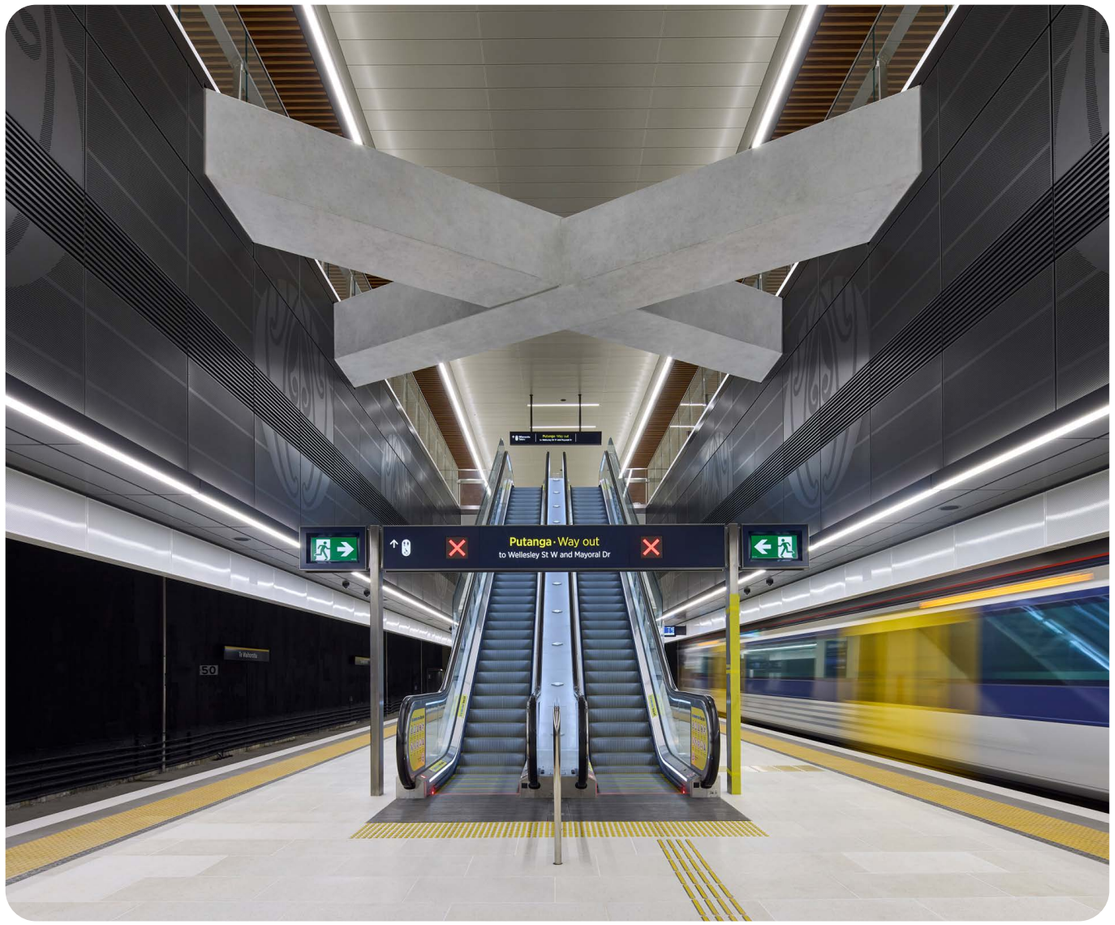
Downer's importance to Queensland is recognised by our induction into the Queensland Business Leaders Hall of Fame in 2017.

"For more than 160 years, the Maryborough Service Delivery Centre has evolved as part of Maryborough's engineering and manufacturing story. As we look to the future, we'll continue to embrace change, build local skills, create opportunities for local businesses and contribute to a strong community."



Boris Schneider

GENERAL MANAGER QLD PROJECTS & CONTRACT DELIVERY



City Rail Link, Te Waihorotiu Station, Auckland

Proven through delivery. Applied through consulting services.

Railways are becoming more connected, more digital and more complex. New fleets must integrate with existing infrastructure. Critical assets need to perform for longer. Networks must balance safety, reliability, sustainability and customer expectations while preparing for future growth.

Downer's Consulting team helps customers navigate that complexity. Combining strategic advisory, engineering expertise and delivery experience, we support the design, delivery and optimisation of transport and infrastructure projects across Australia and New Zealand.

Shaun Robertson

GENERAL MANAGER ENGINEERING CONSULTANCY



For decades, Downer has designed, manufactured, maintained, modernised and integrated some of Australasia's most significant rail assets and transport systems. The expertise gained through delivering these projects now forms the foundation of our Consulting practice, helping customers solve complex challenges across rollingstock, rail systems, infrastructure, asset management, digital transformation and major project delivery.

What sets Downer apart is our deep understanding of the asset lifecycle. Our engineers work alongside the teams responsible for designing, manufacturing, maintaining, modernising and sustaining critical transport assets. This gives us a practical understanding of how engineering decisions influence performance, reliability, maintainability and whole-of-life value.

In many cases, new approaches, technologies and engineering solutions are first developed, applied and refined within projects that Downer delivers. The lessons learned through manufacturing programs, fleet modernisation projects, systems integration activities and major infrastructure deliveries provide valuable insight that can be applied to customer challenges.

The result is more than consulting. It is practical expertise shaped by delivery and focused on outcomes. Whether introducing new rollingstock, extending the life of critical assets, integrating complex systems or preparing networks for the future, we help customers move confidently from concept to implementation.

Shaun Robertson recently joined Downer to lead Downer's Consulting Services, bringing extensive experience delivering complex transport, infrastructure and major project outcomes. Shaun's appointment reflects Downer's continued investment in expanding its consulting capability and supporting customers with specialist expertise across the full asset lifecycle, from strategy and planning through to delivery, integration and operational readiness.

Get in touch with Shaun: Scan the QR code to view his LinkedIn profile.



Diesel Tilt Train | Accessibility upgrade
Supporting Queensland Rail, Downer helped improve accessibility outcomes for the Diesel Tilt Train fleet through stakeholder consultation, full-scale mock-up development and collaborative design. The project focused on accessibility improvements aligned with the Disability Standards for Accessible Public Transport (DSAPT), helping create a more inclusive travel experience for passengers.

City Rail Link | Project delivery support
Engineering support for various stages of Auckland's new City Rail Link railway tunnel and station delivery, integration testing and acceptance. Downer engineers supported the project team with technical support, systems assurance, acceptance case development, testing planning and execution, requirements management and review. The team also developed bespoke AI tools to assist with sorting and finding requirements evidence and project artefacts, helping support the delivery of New Zealand's largest transport infrastructure project.

Next Generation Tram
Partnering with Yarra Trams, Downer's Engineering Consulting Services led Operational Readiness and Operator Acceptance activities as Victoria introduces its next generation fleet of trams. The project supports the introduction of 100 locally manufactured trams to Melbourne's light rail network, helping ensure the fleet is successfully integrated into passenger operations.

Explore our services

"We start with the challenge and do tapestry. Our approach is shaped by experience designing, delivering, operating, maintaining and supporting critical assets and infrastructure in Australia and New Zealand."

safeplus by Downer

Safety, health, wellbeing and personal accountability to strengthen sustainable safety and workforce performance.

assetiQ by Downer

Operational experience, engineering expertise and data-driven insight to improve asset performance, reliability and whole-of-life value.

engin:e by Downer

Engineering expertise, experience, intelligence and technology to solve complex problems and carry ideas through into delivery.

xDNA by Downer

Data, digital and AI with operational context to turn technology into better decisions and measurable outcomes.



HCMT Depot: Delivering operating and Maintaining Signalling and Integrated Rail Systems and Infrastructure

Signalling digitally integrated rail

Modern signalling is about more than technology. It's about integrating rollingstock, infrastructure, operations and digital systems into a railway that performs safely and reliably.

As operators look to improve capacity, interoperability and network performance, signalling is becoming an increasingly important enabler of better customer outcomes. Across Australia and New Zealand, investment in digital signalling and more connected rail systems is helping create networks that are safer, more efficient and better equipped for future growth.

Drawing on experience across some of Australasia's most significant rail projects, Downer delivers signalling solutions spanning the asset lifecycle:

- Design, installation, testing and commissioning of signalling systems
- Development and implementation of communications and data systems
- Installation and certification of electrical and mechanical systems
- Maintenance and through-life support of signalling assets

By combining engineering expertise with operational insight, we're helping customers optimise today's networks while building the foundations for the railway of the future.

Did you know?

Downer is Australia's largest installer and integrator of on-board ETCS.

With experience in system integration, safety assurance, testing and commissioning across complex rail environments.

Section 2

Downer is supporting Australia's rail future through major passenger fleet programs, freight innovation and integrated signalling solutions. By combining long-term maintenance, asset management, manufacturing, digital systems and partnerships, it is helping operators improve reliability, extend asset life, connect supply chains and decarbonise freight through practical, flexible technologies proven in Australian conditions.



Passenger and freight







Queensland Train Manufacturing Program

The Queensland Train Manufacturing Program was established to meet the increasing demand for rail transport in South East Queensland over the next 10 years.

Downer is proud to deliver the Queensland Train Manufacturing Program (QTMP), including the manufacture of 65 six-car passenger trains, a purpose-built manufacturing facility at Torbanlea in the Fraser Coast region, and a new rail facility at Ormeau on the Gold Coast. The program will support South East Queensland's growing rail network, population and economy.

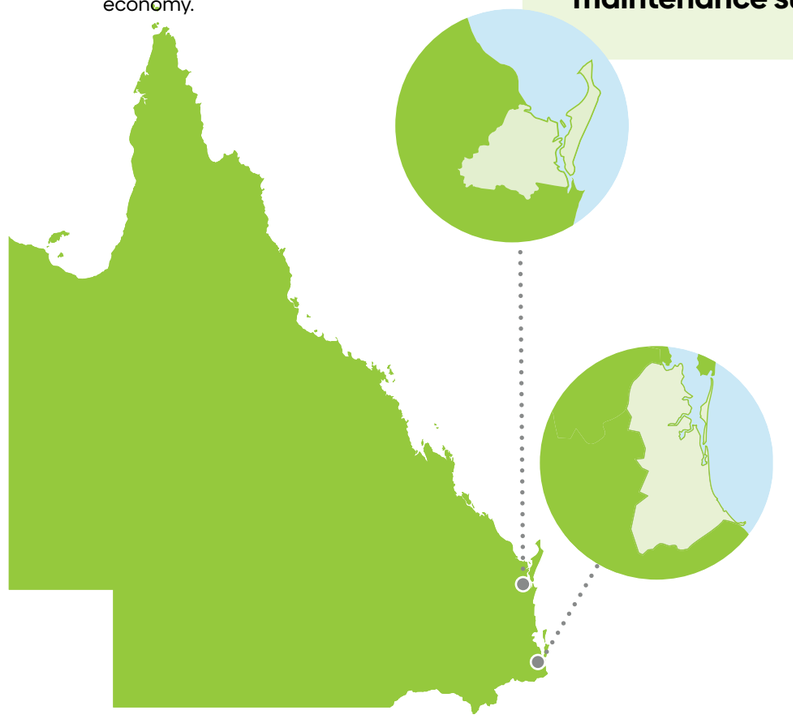
AT A GLANCE

65 six-car passenger trains

Torbanlea manufacturing facility

Ormeau maintenance and stabling facility

Up to 35 years of fleet maintenance support



Building meaningful partnerships that leave a lasting legacy



First Nations mural



Yarning Circle

Successful infrastructure projects are built on more than engineering excellence. They are built on strong relationships, genuine collaboration and a commitment to creating lasting value for the communities in which we operate. Through the Queensland Train Manufacturing Program (QTMP), Downer has worked closely with Traditional Owners, community representatives and stakeholders to ensure local stories, culture and identity are embedded within one of Queensland's most significant rail projects.

A powerful example of this collaborative approach is the creation of a First Nations mural and Yarning Circle at the Torbanlea train manufacturing facility. Developed in partnership with renowned Butchulla artist Fiona Foley, the installation celebrates the enduring connection of the Butchulla people to Country and reflects Downer's commitment to listening, learning and working alongside local communities.

The project demonstrates how Downer goes beyond consultation to foster meaningful stakeholder partnerships. Through extensive engagement with the Butchulla Native Title Aboriginal Corporation (BNTAC) and the establishment of the Butchulla Participation Committee, Downer works collaboratively to help shape outcomes that reflect local priorities, cultural heritage and community aspirations.

At the heart of the installation is Narangi Yeanmom ("little sit"), comprising a 150-metre mural and purpose-built Yarning Circle that celebrate Butchulla culture, stories and kinship. Created through close collaboration with Traditional Owners and community representatives, the artwork ensures cultural knowledge and local history have a permanent place within the facility and its surrounding landscape.

The initiative forms part of Downer's broader commitment to creating inclusive workplaces and fostering trusted relationships with First Nations communities. By bringing together industry expertise, stakeholder engagement and community insights, Downer is helping create infrastructure that delivers social, cultural and economic value alongside operational outcomes.



Specialist equipment installed at Torbanlea

The advanced manufacturing technology behind the next generation of Queensland trains

At Downer's Torbanlea train manufacturing facility, advanced manufacturing technologies are helping deliver the future of rail for Queensland. As Australia's leading rail manufacturer and maintainer, Downer has invested in world-class equipment, digital technologies and specialist manufacturing capabilities to support the delivery of 65 new six-car passenger trains for the Queensland Train Manufacturing Program (QTMP).

Purpose-built to drive precision, quality, efficiency and safety, the facility features some of the most advanced rail manufacturing equipment in the country. This investment reflects Downer's long-standing commitment to innovation and its ability to bring global best practice to Australian manufacturing.

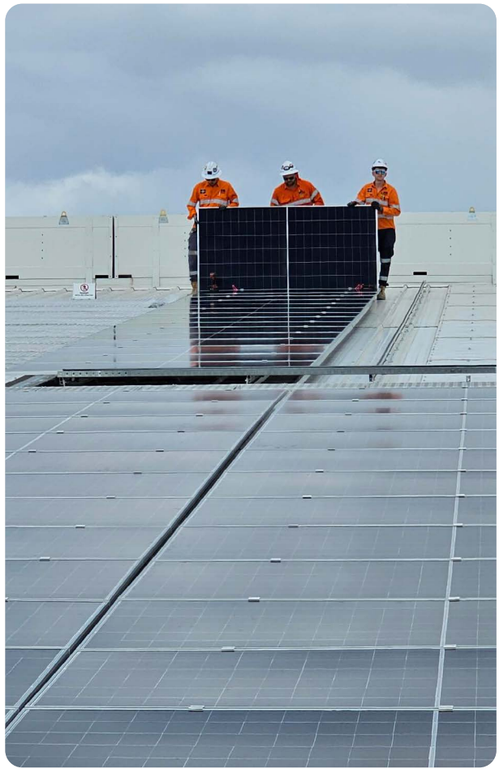
A standout example is the Resistance Welding Robot, the only system of its kind in Australia. The technology streamlines train car assembly through highly accurate, automated welding, enabling simultaneous operations that improve productivity while maintaining exceptional quality standards. Bringing this capability to the Fraser Coast demonstrates Downer's leadership in advanced train manufacturing and its commitment to developing sovereign rail capability in Australia.

The facility is further supported by a suite of sophisticated manufacturing technologies, including a Double Column Machining Centre with advanced CNC capabilities for high-precision bogie frame machining, a robotic GMAW welding system that delivers consistent, high-quality welds, specialised heat-treatment furnaces that enhance component durability and performance, and automated vehicle shifters that improve material movement across the site.

By combining advanced technology, engineering expertise and a highly skilled workforce, Downer is helping shape the future of rail manufacturing in Australia. The specialist equipment installed at Torbanlea not only enhances quality, efficiency and safety, it showcases the innovative manufacturing capability that continues to position Downer at the forefront of the rail industry.

Sustainability at the heart of Queensland's future rail network

For Downer, sustainability is more than a project requirement. It is a fundamental part of how infrastructure is designed, delivered and operated to create lasting environmental, social and economic value.



Rooftop solar installations

The Queensland Train Manufacturing Program (QTMP) reflects this commitment, with sustainability embedded throughout the planning, design and construction of its facilities.

At the Torbanlea train manufacturing facility, environmental stewardship has been a key consideration from the outset. More than 55 hectares of natural bushland has been preserved to protect threatened ecological communities and provide habitat for species including the greater glider and grey-headed flying fox. Wildlife corridors have also been maintained to support biodiversity and enable safe movement of fauna throughout the site.

Sustainability is also reflected in the facility's design. Extensive rooftop solar installations generate renewable energy, while rainwater harvesting systems reduce demand on potable water supplies. Energy-efficient lighting, passive ventilation, natural lighting optimisation and thermally efficient building materials all contribute to lowering energy consumption and reducing the facility's environmental footprint.

The landscape design further demonstrates Downer's commitment to protecting and enhancing the natural environment. Existing vegetation has been retained wherever possible, complemented by native Fraser Coast plant species and ongoing weed and pest management programs that support local ecosystems and biodiversity.

Beyond Torbanlea, sustainability initiatives have also been incorporated into the Ormeau rail facility through renewable energy generation, recycled reinforcing steel, rainwater harvesting and design optimisation measures that reduce embodied carbon and raw material consumption.

By integrating sustainability into every stage of project delivery, Downer is helping to create a more resilient future for Queensland. From conserving natural habitats and reducing emissions to improving resource efficiency and supporting community outcomes, QTMP showcases how sustainable infrastructure can deliver benefits that extend well beyond the life of the project.



Torbanlea rail manufacturing facility

High Capacity Metro Trains

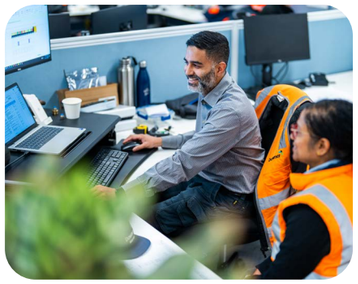


Project Engineering & Delivery Team Celebrating 70 HCMT Trains

Designed to support Melbourne's growing rail network







Left top: Aerial view of the HCMT fleet facility

Left middle: TRES robot

Left bottom: Downer team

The High Capacity Metro Trains (HCMT) fleet is transforming passenger journeys across the Cranbourne, Pakenham and Sunbury lines.

The project combines a modern fleet, maintenance facilities, simulators and long-term support to help deliver a more reliable and accessible transport network for Victoria.

AT A GLANCE

70 seven-car trains delivered

Melbourne's most accessible fleet

Maintenance support through to 2053

$800m of investment in the Victorian supply chain

A light service facility at Calder Park to support operation of the HCMTs on the Sunbury line

Keeping Sydney moving



For more than 15 years, the Waratah fleet has been a defining part of Sydney's rail network.



As Australia's largest passenger train fleet, the Waratah program demonstrates the value of long-term partnerships, through-life support and continuous improvement, helping deliver safe, reliable and comfortable journeys for millions of passengers.

Left: Waratah fleet
Right: Waratah on the Sydney Harbour Bridge

AT A GLANCE

952 carriages

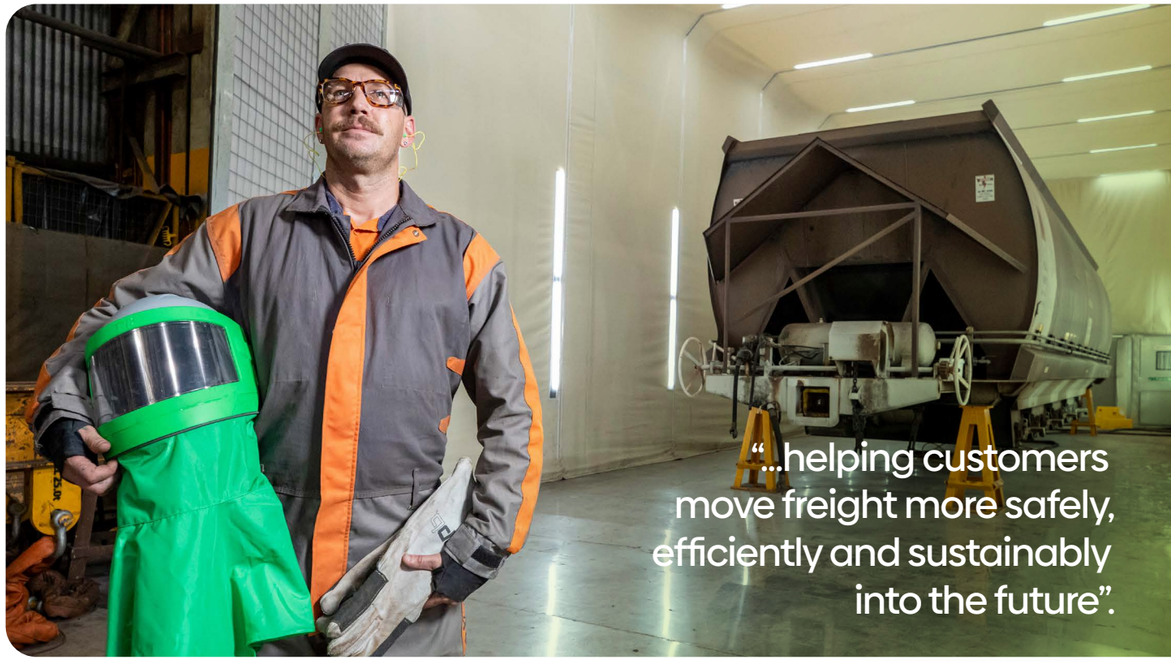
Australia's largest passenger train fleet

40+ year maintenance partnership

~300 million passenger journeys per year

Connecting freight's next opportunity

The rail freight industry is entering a period of significant change.



Specialist rail freight overhaul capability in Maryborough



Troy Sparkman

EXECUTIVE GENERAL MANAGER, FREIGHT & MOTIVE SYSTEMS

Rail operators are being asked to move more freight, improve efficiency, manage ageing assets and respond to growing sustainability expectations. At the same time, many fleets still have years, and in some cases decades, of productive service ahead of them.

While much of the discussion focuses on new technologies, the biggest opportunities are often found in how we improve the performance, utilisation and longevity of the assets and networks we already have.

Across Australia, we're seeing three areas where the industry is increasingly focused: extending asset life, improving freight connectivity and strengthening capability in key regional markets.

Making better use of existing assets

One of the most consistent challenges we hear from customers is how to maximise value from existing fleets while managing increasing obsolescence risks.

Many freight operators are running assets that continue to perform critical roles, but sourcing components, maintaining systems and planning future investment pathways has become increasingly complex. In this environment, obsolescence management is no longer simply a maintenance issue. It is a strategic business challenge.

Successful operators are taking a long-term view by combining engineering expertise, lifecycle planning and targeted upgrades to improve reliability, availability and whole-of-life performance. Rather than focusing solely on replacing assets, the opportunity is often to extend their life through smarter asset management and informed investment decisions.

Connecting ports, rail and supply chains

The second opportunity lies in improving how freight moves through the broader supply chain. Rail continues to offer significant advantages in moving large freight volumes efficiently, but there is often potential to improve the interfaces between ports, terminals, logistics hubs and the rail network itself.

Across the industry, there is growing interest in how better-connected freight systems can improve productivity while supporting sustainability objectives. Even small improvements in network efficiency can deliver meaningful benefits for operators, customers and communities.

One example is the work underway to explore the introduction of zero emission battery electric locomotives and associated wayside charging infrastructure for short haul port to inland terminal operations.

Building capability where it matters most

The third opportunity is ensuring capability exists where customers need it most.

Australia's freight task is diverse. The challenges facing operators in Western Australia's heavy haul environment are different from those faced by customers on the East Coast, but both require deep operational understanding and practical solutions.

In Western Australia, freight operators manage some of the most demanding rail environments in the world, supporting critical mining and bulk commodity supply chains. Across the East Coast, operators are focused on reliability, availability and supporting increasingly connected freight networks. These markets require local knowledge, strong customer relationships and the ability to bring together specialist engineering, maintenance and asset management expertise.

For Downer, this means continuing to invest in regional capability while working closely with customers and partners to address the challenges that matter most to their operations.

Partnerships to shape the future

The common thread across all of these opportunities is collaboration.

No single organisation will solve the freight industry's challenges alone. Success will depend on operators, maintainers, technology providers, infrastructure owners and supply chain partners working together to identify practical solutions and deliver them at scale.

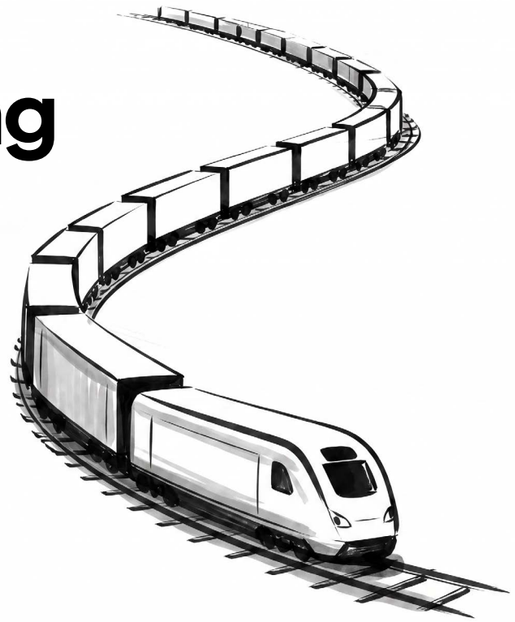
That is why Downer takes a technology-agnostic approach. Our focus is not on promoting a single solution. It is on understanding our customers' challenges and bringing together the right expertise, technologies and partnerships to support better outcomes.

Whether that involves extending asset life, managing obsolescence, improving supply chain connectivity or exploring new technology concepts such as zero emissions locomotives, the objective remains the same: helping customers move freight more safely, efficiently and sustainably into the future.

Freight decarbonisation has become one of the rail industry's most important conversations, but for operators, the challenge is rarely as simple as choosing a new locomotive technology. Every decision must balance emissions reduction with reliability, asset life, operational performance and long-term investment priorities.

Australia's freight task adds another layer of complexity. Long distances, heavy haul operations and remote networks demand solutions that work in the real world, not just on paper.

Decarbonising freight with confidence





Chris Bowen

GENERAL MANAGER PARTNERSHIPS

shares his perspective on the technologies, partnerships and practical decisions that will help shape the future of lower-emission freight rail in Australia.

1. Why is freight decarbonisation moving from aspiration to business necessity?

For many freight operators, decarbonisation is still competing with a long list of other operational priorities. Rail assets are expensive, long-lived investments and there is a natural reluctance to replace proven fleets before the technology, infrastructure and economics are fully understood.

What's changed over the last few years is that sustainability is no longer sitting on the sidelines of business planning. Customers, investors and governments increasingly want to know not only what an organisation's ambitions are, but how it intends to achieve them.

At the same time, operators are starting to recognise that doing nothing isn't really an option. The question is no longer whether freight rail will decarbonise, but how and when.

Australia also faces a very different challenge from many overseas markets. Our freight task is characterised by long distances, heavy haul operations and some of the harshest operating environments in the world. Solutions that work elsewhere won't necessarily translate directly here.

That's why I think the focus needs to be on proving technologies in real operating conditions. The more evidence we can generate in live environments, the more confidence operators will have when making long-term investment decisions.

2. What is the biggest misconception about freight decarbonisation?

We often talk about freight decarbonisation as an emissions challenge. In practice, it's just as much an asset management challenge.

Most operators understand the need to reduce emissions. The harder question is what that means for fleets designed to run for decades, and how you make investment decisions while technology continues to evolve.

Many freight fleets still have significant operational life ahead of them. Replacing assets before the end of their useful life is rarely straightforward from either a commercial or operational perspective.

That's why the conversation needs to move beyond technology alone. Decarbonisation isn't simply about introducing new locomotives. It's about understanding fleet strategy, investment cycles, operational requirements and customer outcomes.

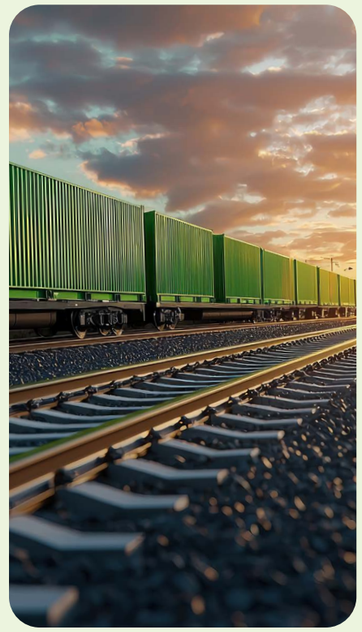
In the end, the organisations that make the most progress will be those that align sustainability objectives with strong asset management and long-term business planning.

3. Is there a clear technology winner emerging?

Everyone wants to know which technology will win.

The reality is that most operators aren't looking for a winner. They're looking for confidence.

From what we're seeing, battery-electric and hybrid battery-diesel



solutions currently appear to offer the most practical near-term pathway for many freight applications. They can deliver meaningful emissions reductions while fitting within existing operating models.

At the same time, renewable fuels are likely to play an important role during the transition. Many diesel fleets still have decades of useful life remaining, and alternative fuels may help reduce emissions without large-scale fleet replacement.

Hydrogen continues to attract interest, but there are still challenges around infrastructure, energy production, storage and overall system economics. For most operators, it remains a longer-term consideration.

The more important question isn't which technology wins. It's how operators can begin their journey today while maintaining flexibility as technologies continue to develop. That's where I think the market's focus should be.

4. What should operators be focusing on right now?

The good news is that organisations don't need to wait for the next generation of technology to get started.

Many operators are already reducing fuel consumption through better planning, driver advisory systems, idle reduction programs and operational improvements. These initiatives can deliver immediate emissions reductions while improving performance and reducing costs.

At the same time, operators should be building a clearer understanding of fleet age, replacement timing and which routes may be suitable for emerging technologies.

Just as importantly, they need to look beyond the locomotive itself. Decarbonisation isn't simply about introducing a new product. It requires consideration of charging infrastructure, energy supply, maintenance capability and, in some cases, future network electrification.

The organisations making the most progress are taking a whole-of-system view, connecting fleet strategy, infrastructure planning and operational requirements into a single roadmap.

5. What partnership opportunities exist?

No organisation is going to solve freight decarbonisation on its own.

Operators understand their networks and customers. Technology providers bring engineering expertise and innovation. Governments, infrastructure owners, financiers and energy providers all have important roles to play.

At Downer, we've seen the power of this model in passenger rail.

Render of Downer's Battery-Electric Locomotive





Western Australia Iron Ore Jimblebar, WA

> “reduce emissions without compromising reliability, productivity or commercial performance”.

Delivering and maintaining complex rail assets requires organisations with different expertise to work together towards a common outcome.

Freight decarbonisation will be no different. Success will depend on bringing together technology, infrastructure, operations and investment into solutions that work in the real world and can be delivered successfully.

Our role is to help connect those elements, reducing risk, testing new technologies in operational environments and helping customers move from concept to implementation with confidence.

6. Looking ahead to 2030, what does success look like?

By 2030, success won’t be measured by how many new locomotives we’ve introduced.

Success will be measured by whether operators can reduce emissions without compromising reliability, productivity or commercial performance.

I expect we’ll see battery-electric locomotives operating successfully across a range of Australian freight applications, supported by real operating data and proven business cases. Decarbonisation will increasingly be embedded within fleet planning and asset management rather than treated as a standalone sustainability initiative.

Australia’s freight task is unique. Success will come from developing technologies, partnerships and operating models that are proven to work in Australian conditions and give operators the confidence to invest.

Ashley Thompson

GENERAL MANAGER BUSINESS DEVELOPMENT FREIGHT & MOTIVE SYSTEMS



Getting more from East Coast freight fleets

Australia's East Coast is one of the country's most important freight corridors, connecting ports, terminals, regional industries and major population centres. As freight grows, operators need to move more while maintaining the reliability and availability of fleets working hard across long distances. Ageing assets, supply chain constraints, component obsolescence and specialist skills shortages are making that harder. New assets and technologies will be part of the answer. But there is also significant value in getting more from the fleets already in service.

Reliability is becoming a whole-of-life challenge

Freight assets operate in demanding conditions and are expected to remain productive for decades. As fleets age, components become obsolete, lead times increase and specialist skills become harder to source. Managing those risks requires a whole-of-life view. Identifying obsolescence early gives operators more time to decide whether to repair, replace or upgrade, rather than being forced into a decision when a component fails or becomes unavailable.

Where components are appropriately engineered, qualified and assured for their intended application, OEM-equivalent alternatives can provide another safe and reliable option. Alongside repair, refurbishment and engineered upgrades, they can give operators greater choice in managing availability, lead times and whole-of-life cost.The right approach depends on the asset, its operating requirements, remaining life and the technical assurance required. The question is not whether a component carries the original brand, but whether it can demonstrate the safety, performance, quality and reliability required for the application.

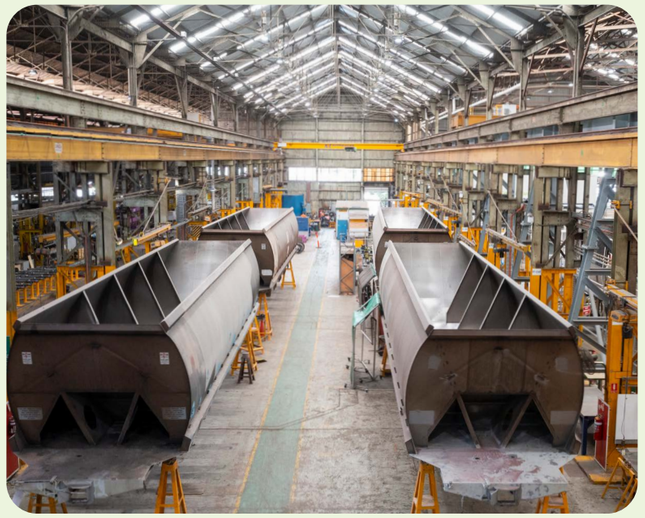
Turning obsolescence into an opportunity to modernise

Planned interventions can provide an opportunity to introduce technology that improves reliability, efficiency and environmental performance.

"Rather than replacing an obsolete component like-for-like, operators can consider whether newer technology can enhance reliability, whilst reducing emissions."

Scan the QR code to read our white paper on practical pathways to lower freight emmissions.





Wagon overhauls & refurbishment, Maryborough Service Delivery Centre

Upgrading traction, control and energy-management systems can extend asset life while preparing fleets for future requirements.

Downer's work with ZTR is one example. Technologies such as SmartStart can reduce unnecessary locomotive idling, fuel consumption and emissions, while NexSys can replace ageing control systems with modern architecture, diagnostics and equipment protection. These types of modular upgrades allow operators to capture benefits from the fleet they have today while creating a foundation for further modernisation.

For operators with long-life freight assets, the transition to lower emissions does not necessarily start with replacing the locomotive. It can be staged: improve how the asset performs today, modernise systems as they become obsolete, and introduce new technologies.

The opportunity is to use each intervention to make the fleet more reliable, efficient and ready for what comes next.

Moving from reactive to predictive maintenance

Better asset information is also changing how freight fleets can be maintained. Condition monitoring, analytics and asset intelligence can identify changing performance before it becomes a failure. Combined with maintenance history, engineering knowledge and operational experience, that information can help teams intervene earlier, plan work around operations and focus resources where they will have the greatest impact.

For an operator, that can mean fewer unexpected failures, improved fleet availability and better decisions about whether a component remains in service, is repaired or refurbished, or needs to be replaced.

The opportunity is to turn that data into better maintenance and asset decisions. Technology will assist with those decisions, but engineering expertise and operational experience remain critical to understanding what the information means for an asset operating in the real world.

What could East Coast rail freight look like in 2030?

By 2030, operators should have greater visibility of asset condition and performance, and maintenance should increasingly be based on evidence rather than failure.

Operators should also have more choice in how they sustain their fleets. The opportunity is to combine engineering expertise, operational experience, asset intelligence and smarter through-life strategies to keep East Coast freight moving safely, reliably and efficiently.



Section 3

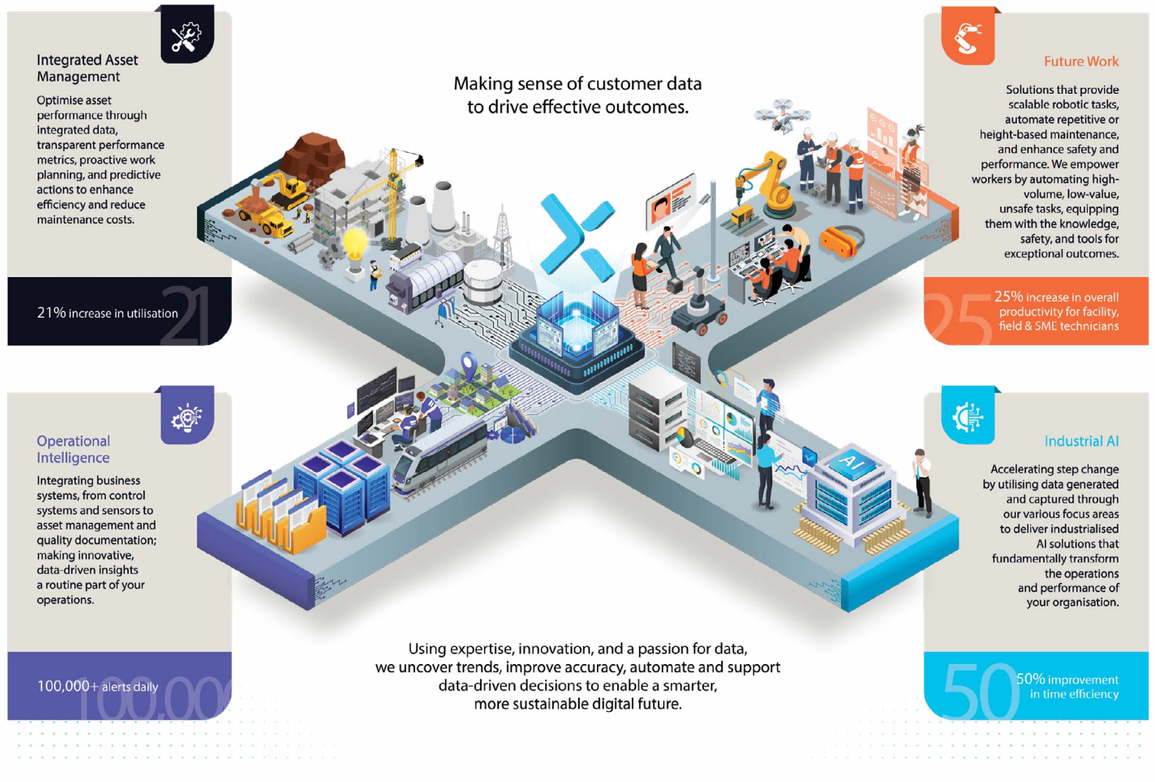


Downer is using AI, data platforms and robotics to help rail operators turn complex information into safer, faster and more reliable decisions. Through solutions such as DeliveryDNA, Cognition, autonomous underframe inspections, drones and cleaning robots, it connects asset data, engineering knowledge and real-world operations to predict faults, improve assurance, reduce maintenance risk and support frontline teams rather than replace them.

Digital & robotics platform







Every railway has more data than ever before

Why are engineers still spending hours searching for answers?

Every train, maintenance activity, engineering change and operational event creates a digital footprint. Telemetry, asset records, technical documentation, safety evidence and inspection data accumulate across the lifecycle of a railway.

Yet more information does not automatically lead to better decisions.

The real opportunity is to connect that information with engineering knowledge and operational experience, helping people understand what is happening, why it is happening and what action to take next.

"AI does not replace that expertise. It amplifies it. By reducing repetitive work, connecting fragmented information and making patterns easier to detect".

XDNA by Downer

Artificial intelligence is accelerating this shift. But in rail and transit systems, where decisions affect safety, reliability and service continuity, AI cannot simply be added as another layer of technology. It must be grounded in the operational reality of assets, people and processes. It must be explainable, traceable and governed. Most importantly, it must earn the confidence of the people expected to use it.

This changes the conversation from AI initiatives to solutions with purpose.

The measure of success is not the sophistication of an algorithm or the number of proof of concepts (PoCs) launched. It is whether technology helps an engineer find the cause of an incident faster. Whether an emerging fault can be identified before it affects service. Whether complex project information can be traced with greater certainty. Whether people can spend less time searching and more time applying their expertise.

AI does not replace that expertise. It amplifies it. By reducing repetitive work, connecting fragmented information and making patterns easier to detect, AI can help specialists focus on the higher-value judgements that require experience, context and human oversight.

The organisations that move successfully from experimentation to industrial application will be those that treat information security, data quality, governance and workforce adoption as seriously as the technology itself. In safety-critical environments, trust is not a feature to add later. It is the foundation for scale.

At Downer, this work is being led through **XDNA**, Downer's digital and data solutions business. XDNA brings together engineers, data scientists and domain specialists with experience in the industries they serve. This combination of engineering rigour, industrialised AI, and operational understanding helps organisations move from data to decisions faster, while keeping governance, security and people at the core.

Across rail and transit systems, that thinking is already taking practical form. Asset intelligence is helping teams connect fleet data with engineering knowledge. Predictive capabilities are enabling earlier interventions. Digital environments are supporting testing before physical assets become available. Sovereign AI is strengthening knowledge access and assurance. Robotics and automation are changing how inspection and maintenance activities can be undertaken.

These innovations point to a more intelligent railway, not one where technology operates separately from people, but one where digital and human expertise work together to create safer, more reliable and better-informed operations.

The future of Rail & Transit Systems will not be defined by how much data it collects. It will be defined through the use of insights, with confidence that these insights can be turned into action.

Explore our industrial intelligence innovation



TrainDNA
Asset intelligence and predictive maintenance

Page 36



Digital Depot Solution
Real-time depot intelligence

Page 38



Software Integration Facility
Testing the intelligence of a train before the physical fleet is available

Page 39



DeliveryDNA
AI-powered knowledge solution supporting access, traceability and assurance

Page 40



Downer and Future Maintenance Technologies
The next generation of automated inspection with Train Underframe Examination System and Rail Facility Drones

Page 42

Turning rail data into smarter decisions

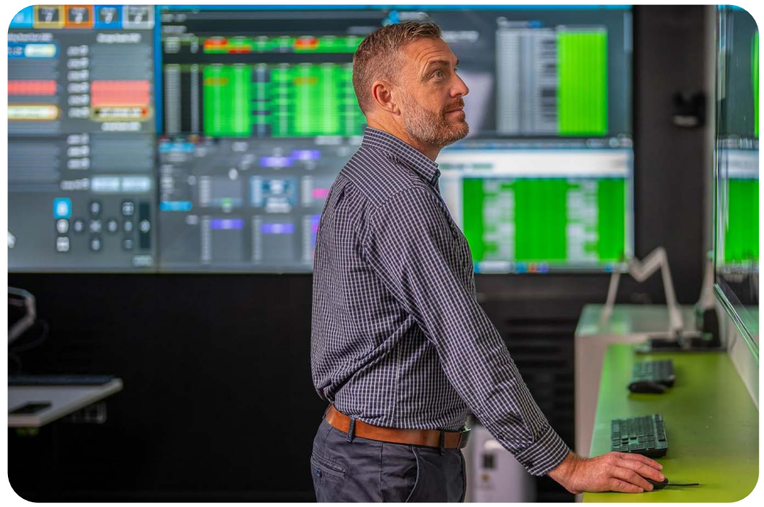
Railways generate enormous volumes of information every day, from operational data and maintenance records to engineering documentation, telemetry and asset inspections. Yet much of this information remains fragmented across systems, making it difficult for operators to gain a complete picture of asset performance.

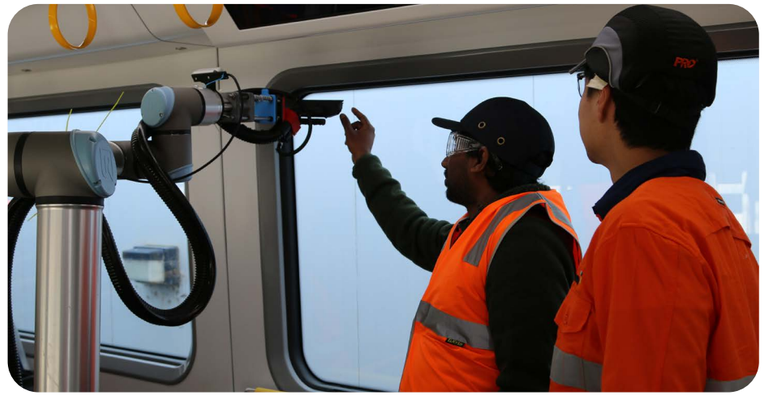
TrainDNA is Downer's comprehensive suite of rail and transit asset management solutions, bringing together advanced analytics, artificial intelligence, digital engineering and simulation capabilities to help operators make faster, more informed decisions. By connecting data across the asset lifecycle, TrainDNA provides a clearer view of fleet and infrastructure performance, helping organisations improve reliability, availability and operational efficiency.

"The future of asset management isn't about collecting more data. It's about turning complex information into insights that help operators make decisions earlier, reduce risk and get more value from their assets." Sura Mendis, General Manager Industry Solutions, XDNA

At the heart of the platform is **Asset Intelligence & Analytics**, a capability that acts as a virtual fleet engineering team. Powered by the latest agentic AI technologies, it connects rollingstock telemetry, maintenance records, operational data and technical documentation to rapidly identify the causes of performance issues and incidents. Information that would traditionally be spread across numerous systems and require extensive engineering investigation can be analysed in minutes, enabling faster diagnosis, improved decision-making and better operational outcomes.







Left top: Auburn Integrated Operations Centre, NSW

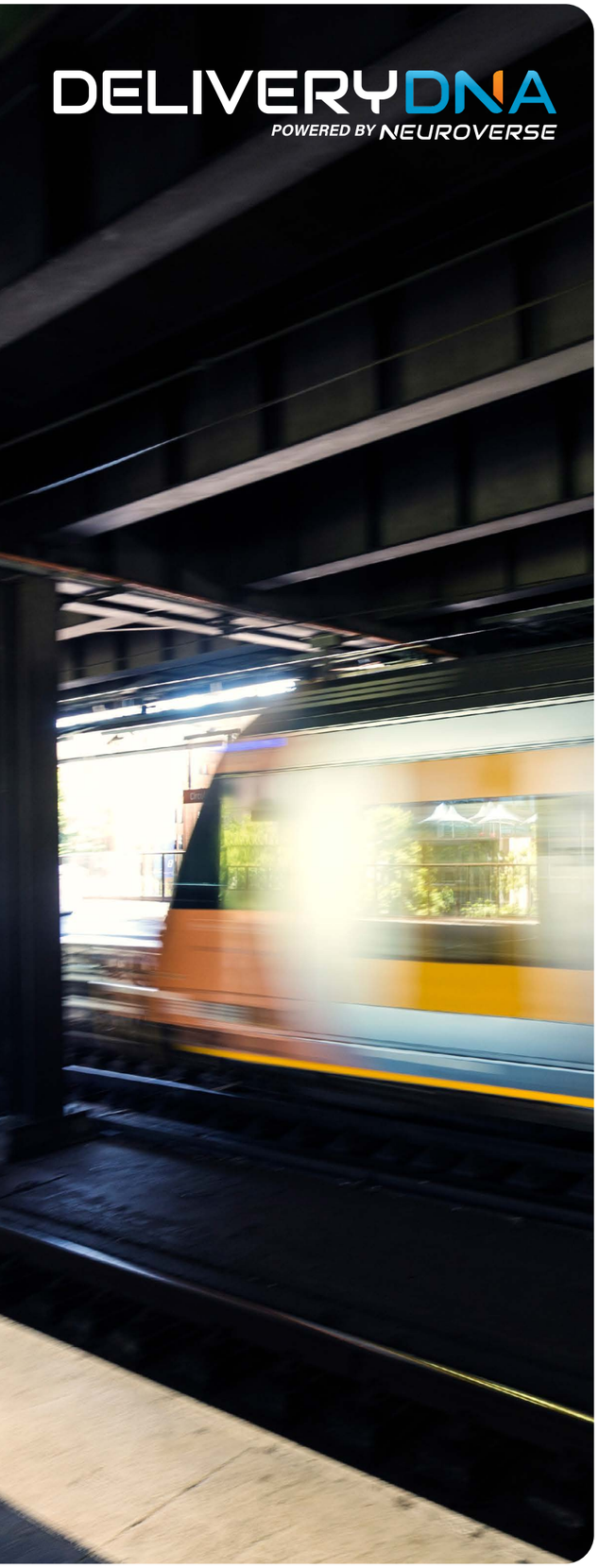
Left bottom: Cleaning robot testing.

This ability to connect and interrogate information across traditionally siloed data sources is changing how rail organisations respond to operational challenges. Instead of spending valuable time searching for information, engineers can focus on solving problems, understanding emerging trends and making informed decisions that improve fleet performance and passenger outcomes.

Complementing this capability is **Condition Monitoring & Predictive Maintenance**, which helps operators move beyond reactive maintenance strategies. Using advanced analytics and AI, TrainDNA continuously monitors asset condition to detect emerging issues at the subsystem level before they impact operations. By identifying risks earlier and enabling targeted interventions, operators can reduce unplanned downtime, extend asset life and optimise maintenance resources.

Together, these capabilities give operators a powerful new way to manage complex fleets. Asset Intelligence & Analytics helps organisations understand what is happening and why, while Condition Monitoring & Predictive Maintenance helps them anticipate what might happen next. The result is a more proactive, data-driven approach to fleet management that improves reliability, supports better operational planning and unlocks greater value from rail assets throughout their lifecycle.

DeliveryDNA showcases how the next generation of industrial AI is helping rail operators move from data to decisions faster.



DeliveryDNA turns complexity into clarity

Complex projects are under constant pressure to deliver safely, on scope, on time and on budget. When requirements, design evidence, compliance data, risks, testing outcomes and progress information are spread across disconnected systems, it becomes harder to see what matters, where issues are emerging and what action to take next.

DeliveryDNA transforms how project teams monitor and govern delivery by providing a connected, intelligent view of performance. It improves traceability, surfaces risks sooner, reduces assurance overhead, and gives stakeholders the confidence to make faster, better-informed decisions.

Powered by Neuroverse Cognition, DeliveryDNA uses specialised AI Agents to continuously analyse project information, establish traceability, assess compliance and surface actionable insights from across complex delivery environments.

What DeliveryDNA helps you achieve

- A connected view of project performance across people, processes and systems.
- End-to-end traceability from requirements through to testing, assurance and acceptance.
- Reduced effort spent on assurance, audits, reporting and compliance activities.
- Earlier identification of delivery risks, issues and non-conformances.
- Faster, better-informed decisions based on trusted project evidence.

"Turn your project delivery data into confidence, control and better delivery outcomes."

- Enables efficiency, quality, and in-built traceability of Validation and Verification under Engineering Assurance.
- Greater confidence that projects are being delivered safely, efficiently and in accordance with stakeholder expectations.
- Establishes the DNA of a project scope – understanding requirements, designs, technical documentation, quality and testing controls. This becomes invaluable in enduring support of the built 'asset' in operations – an AI enabled digital twin of the asset.

AI-Enabled Assurance

An AI-driven engineering assurance assistant embedded into project workflows:

AI reasoning across:

- Project requirements and contractual obligations
- Applicable standards and regulatory frameworks
- Verification & validation plans
- Quality plans, test evidence and transmittals

Continuously identifies:

- Traceability gaps
- Compliance risks
- Missing or weak assurance evidence
- Variations emerging during design, delivery, or commissioning

Digital Project Evidence

- Structured workflows aligned to assurance milestones
- Real-time visibility of engineering and delivery progress
- Evidence-led tracking from daily activities through to contractual deliverables
- Automated generation of structured, open-format handover packs suitable for long-term archiving.



Case Study:

City rail link: Digital assurance at scale

City Rail Link is New Zealand's largest transport investment, introducing Auckland's first fully underground railway stations and transforming rail capacity across the city. As the program moved towards opening, one of the key challenges was connecting years of requirements, testing, engineering change and operational evidence into a clear pathway for acceptance.

Working alongside Downer's Consulting Services team, Cognition helped accelerate access to project knowledge and improve assurance visibility across large and complex datasets. The platform enabled users to interrogate project documentation, trace evidence and support decision-making during critical phases of systems integration, testing and operational readiness.

XDNA Solution

XDNA deployed DeliveryDNA using Neuroverse Cognition to create a team of specialised AI Agents that could analyse, connect and interpret large volumes of project information.

Each agent was configured for a specific assurance capability, including requirements analysis, traceability, verification and validation, and compliance assessment.

By combining domain expertise, advanced AI models and secure access to project systems, the solution helped the team reduce manual effort and access trusted project evidence faster.

On track to revolutionise rail operations





TRES Robot

How autonomous technology is helping transform the way rail operators understand asset condition.

Every maintenance decision begins with understanding asset condition.

For generations, rail operators have relied on skilled technicians to inspect rollingstock, identify emerging issues and ensure fleets continue to operate safely and reliably. Their expertise remains at the heart of maintenance operations today.

But as fleets become more complex, maintenance windows shrink and pressure on reliability continues to increase, rail operators are looking for new ways to access richer, more consistent asset intelligence.

Through its partnership with Australian robotics company Future Maintenance Technologies (FMT), Downer is helping lead this evolution.

Together, Downer and FMT are bringing autonomous inspection technology to the rail industry, combining robotics, advanced sensing technologies and AI-enabled analysis to support safer inspections, more consistent data collection and better-informed maintenance decisions.

Train Examination System (TRES)

For decades, rail inspection has relied on people going to the asset. TRES represents the next evolution: autonomous inspection that delivers richer, more consistent data while allowing maintenance teams to focus on what matters most, making informed decisions that improve safety, reliability and performance.

TRES uses LiDAR, laser measurement technology, optical sensing and AI-enabled analysis to autonomously inspect rollingstock and generate detailed digital inspection records.

Rail Facility Drones (RFD)

Rail Facility Drones extend autonomous inspection beyond rollingstock to rail facilities and infrastructure. By combining autonomous flight with advanced sensing technology, these systems can perform inspections traditionally undertaken at height, improving site safety and reducing the need for asset isolation during inspection activities. See **page 44** for more details.

Moving beyond traditional inspection

Traditional inspections provide a snapshot of asset condition at a point in time.

Autonomous inspection creates something more valuable: a detailed digital record that can be analysed, compared and tracked throughout an asset's life.

As rollingstock passes through TRES, multiple sensing technologies capture information about critical components, creating a consistent baseline of asset condition. Maintenance teams can access detailed imagery, digital models and inspection records, delivering a deeper understanding of asset health and performance.

The result is not simply more data. It is better data.

From data to asset intelligence

The future of rail maintenance lies in turning inspection data into actionable insight.

As operators shift towards condition-based maintenance, the challenge is not generating more information. It is generating information that is accurate, repeatable and comparable over time.

Because autonomous systems perform inspections consistently, they can help identify changes in asset condition earlier, support more targeted maintenance interventions and improve confidence in maintenance planning.

The result is a smarter understanding of asset performance, reliability and lifecycle management.

Australian Premiere

Discover how autonomous inspection technology is helping rail operators:

- Improve inspection consistency
- Capture richer asset data
- Support condition-based maintenance
- Enhance workforce safety
- Unlock smarter maintenance decisions

TRES AT A GLANCE

Train Examination System (TRES)

- **Developed by Downer XDNA and Future Maintenance Technologies (FMT)**
- **Autonomous rollingstock examination platform**
- **Uses LiDAR, laser measurement and optical sensing technologies**
- **AI and machine learning-enabled analysis**
- **Generates detailed digital inspection records**
- **Designed specifically for the rail environment**



Rail Facility Drones (RFD)

Autonomous drones helping rail operators see more of their railway

When people think about rail inspections, they often picture technicians working beneath trains. Yet some of the most critical assets sit above them.

Overhead wiring, support structures, insulators and depot infrastructure form the backbone of railway operations. Keeping them in service depends on regular inspection, often in environments that require working at height, specialised access equipment and planned outages.

Just as the Train Underframe Examination System (TRES) reimagines how rollingstock is inspected, Rail Facility Drones (RFD) are changing how operators monitor critical rail infrastructure. Together, they help deliver a more complete understanding of railway condition, from the underside of a train to the overhead systems that keep it moving.

“...using robotics, AI and engineering expertise to help people make better maintenance decisions”.

Rail Facility Drones (RFD)

Rail Facility Drones combine autonomous flight, advanced sensing technology and AI-enabled analytics to inspect rail facilities and infrastructure. Using high-resolution optical and thermal imagery, the system captures detailed information on overhead assets and facility infrastructure, automatically identifying anomalies and potential defects.

The goal is straightforward: give maintenance teams access to more consistent, repeatable and actionable information while reducing the need for people to perform routine inspections in higher-risk locations.

A different way to inspect

At the Downer Pakenham Rail Depot in Victoria, home to the High Capacity Metro Trains (HCMT) fleet, RFD is inspecting more than 20 kilometres of live overhead infrastructure and assessing over 19,000 components every month. According to FMT, these inspections are completed without requiring power isolation and achieve accuracy levels of up to 98 per cent.

Autonomous drones follow pre-programmed inspection missions, capturing optical and thermal imagery while operating across the depot. The resulting information is analysed using more than 35 machine-learning models before being delivered into maintenance workflows as actionable defect intelligence.

Seeing the railway differently

Consistent inspections create consistent data. Consistent data provides a clearer view of asset performance. Over time, that insight can help maintenance teams better understand deterioration, prioritise interventions and support condition-based maintenance strategies.

This is the same philosophy underpinning Downer and FMT’s broader approach to autonomous inspection: using robotics, AI and engineering expertise to help people make better maintenance decisions.

RFD AT A GLANCE

- **Autonomous drone inspections for rail infrastructure and facilities**
- **Optical and thermal imaging capability**
- **AI-enabled defect identification and reporting**
- **20km of overhead infrastructure monitored at Pakenham Rail Depot**
- **19,000+ components inspected monthly**
- **Up to 98% reported inspection accuracy**
- **Designed for active rail environments without major changes to depot operations**

Connect with our team

From Rail Facility Drones (RFD) to the Train Examination System (TRES), Downer and FMT are helping rail operators build a more complete understanding of asset condition through autonomous inspection technologies.



Downer's autonomous cleaning robot prototype

Project Snapshot

Downer and Intelligent Systems Research and Innovation (IISRI) have invented the world's first autonomous rollingstock cleaning robots with target capability that detects vandalism and hazards.

Partner: Downer Rail and Transit Systems

Research team: Associate Professor Zoran Najdovski, Associate Professor Samer Hanoun, Dr Pradeep Herath Mudiyanselage, Mr Chris Larkin, Dr Ahmad Abu Alqumsan, Mr Samuel Gan, Mr Boyd Rosevear, Mr Andrew Miller, Dr Adetokunbo Arogbonlo, Dr Mohammad Rokonuzzaman Pappu, Dr Van Thanh Huynh (SEBE)

Automation with purpose

Exploring how Downer is applying robotics to real-world rail maintenance challenges.

Rail innovation is often associated with rollingstock, signalling and digital systems. Increasingly, however, operators are also looking at how automation can improve the everyday tasks that support fleet performance and passenger experience.

One example is Downer's **autonomous cleaning robot** prototype, developed in partnership with Deakin University's Institute for Intelligent Systems Research and Innovation (IISRI). Designed specifically for the rail environment, the project explores how robotics can assist with cleaning and maintenance activities within passenger rollingstock.

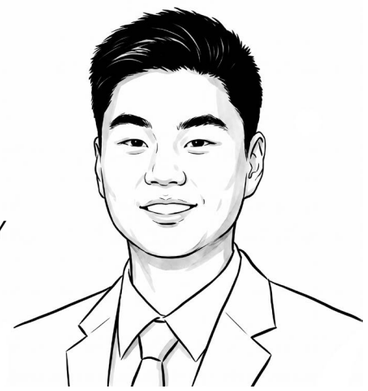
The prototype was created to address a practical challenge facing rail operators: maintaining consistently high standards of cleanliness while improving safety and efficiency for frontline teams. Published project material notes that the technology is designed to work alongside cleaning staff, supporting repetitive and physically demanding tasks rather than replacing them.

Developing robotic solutions for passenger trains presents unique engineering challenges. Train interiors are confined, highly variable environments filled with obstacles, seating configurations and fixtures that require sophisticated navigation and sensing systems. The Downer and Deakin collaboration has focused on designing technology capable of operating effectively within these real-world conditions.

The project reflects a broader trend across the rail sector, where operators are investigating how automation and advanced technologies can improve maintenance outcomes, enhance workplace safety and support the adoption of Industry 4.0 practices. According to published project information, the program also creates opportunities for workforce development in robotics, operations and maintenance.

Jason Zhou

TECHNOLOGY STRATEGY ENGINEER



The initiative has been led by a multidisciplinary team within Downer's Rail & Transit Systems business, including Technology Strategy Engineer **Jason Zhou**. In 2026, Zhou received Downer's CEO Award, recognising his contribution to rail engineering innovation and his role in the development of the autonomous cleaning robot prototype.

"As Australia's leading rail and transit systems provider, Downer is already focused on productivity and supporting local communities, so of course our robotic offering is also focused on that," Mr Zhou said.

"It's been wonderful to partner with Deakin University to develop these robotic solutions to help showcase the expertise of our nation when it comes to Industry 4.0, innovation and automation."

The project prototype and research-led innovation program has enabled key learning and progression into Downer's next and current phase for a new production product realisation phase of cleaning innovation. The prototype collaboration demonstrates the value of bringing together rail operations, engineering expertise and university research to solve practical industry challenges. Through collaborations such as this, Downer continues to explore how emerging technologies can contribute to safer, smarter and more efficient rail networks.

Section 4

Great railways are built by great people. Across Downer, we're investing in the talent, skills and pathways that will shape the next generation of rail and transit systems. From apprentices and graduates to experienced specialists recruited from around the world, we're creating opportunities for people to contribute to projects that matter, develop rewarding careers and help deliver better outcomes for passengers, operators and communities.





Make the difference that matters



Make the difference that matters.



Making a difference has always been part of our DNA. We deliver essential services people rely on, create infrastructure that connects us, and enable communities to thrive.

For more than 160 years, it's been our people who've made that happen. And it's our people who will shape our future. Because when we see a challenge, we own it, we work alongside our customers to solve it, and we back each other to get it done – safely, reliably and as one team. Everything you bring to Downer makes a difference that matters.

And when you join us, we'll make a difference for you too, supporting you to grow, be part of something meaningful, and together, shape your future.

The work we do shapes how communities move, connect and thrive.

Support you can count on

For over 160 years, we've backed our people the same way we back our customers; with commitment, support, and a genuine focus on helping you thrive. Here, you'll find opportunities to grow and be part of a team that supports you – both at work and outside of it. Safety comes first, and people stand for each other every day.

Be part of something big

From roads and rail to water, power and gas; across health, education, defence and social housing, we strive for excellence, because the work we do matters to millions. Working together with people from all backgrounds, you'll bring your unique skills and experience to help keep Australia and New Zealand running.

Shape your future

When you work at one of Australia and New Zealand's largest employers, the opportunities are everywhere. Whether you want to solve problems of national importance, explore new opportunities, or build expertise right where you are, you'll be supported to shape a future that works for you.

Our culture

We combine the discipline of an operator.

The mindset of an engineer.

The curiosity of an innovator.

And the commitment of a long-term partner.

That's what enables us to solve complex challenges, embrace new technologies and create lasting value for our customers and communities.

But it's also how we work.

We own the outcome.

We don't stop at identifying problems. We take responsibility for solving them.

We do it for our customers.

Whether we're delivering a fleet, integrating new technology, maintaining critical assets or supporting network operations, we focus on creating practical outcomes that improve performance, reliability and safety.

"...different perspectives come together, better outcomes follow".

And we stand for each other.

The most complex transport challenges cannot be solved by one person, one discipline or one organisation. They require people who collaborate, share knowledge and support one another to achieve a common goal.

That's why engineers work alongside operators.

Data specialists work alongside maintainers.

Project teams work alongside customers.

Because when different perspectives come together, better outcomes follow.

Team members at Pakenham East Depot, Victoria





Steve, and Beth

Meet Beth: following her own path in fabrication

As the Queensland Train Manufacturing Program's (QTMP) first apprentice at Torbanlea, Beth is building more than Queensland's next generation of trains, she is building a career in fabrication. Inspired by her father's work with Downer as a boilermaker, she has forged her own path in the trade and is helping shape the future of train manufacturing in Queensland.

Q: Beth, tell us about your role at QTMP.

Beth: I'm Beth, and I'm a fourth-year fabrication apprentice at QTMP. My trade is fabrication and boilermaking. I spend my time working on welding and fabrication tasks as part of the train manufacturing process.

Q: What inspired you to pursue a career in fabrication?

Beth: My dad's career has influenced me. He's been welding for most of his life, and seeing what he did encouraged me to look at a career in the trades.

Q: What brought you to the QTMP project?

Beth: I started with Downer in Maryborough and moved across to the new Torbanlea facility. The opportunity to be part of a brand-new site was exciting. It felt like a chance to be involved in something from the beginning and be part of a project with a lasting impact on Queensland communities

Q: What was it like finding out you would be the first apprentice at Torbanlea?

Beth: No, I had no idea. I was excited when I received the news. It's a great opportunity and something I feel proud to be part of.

Q: What have you enjoyed most about working at Torbanlea?

Beth: The sense of community and fantastic culture. Everyone is friendly and supportive. It's been great getting to know people and work alongside such a positive team.

Q: What would you say to someone considering an apprenticeship?

Beth: Just go for it. You've got nothing to lose. You get a qualification at the end, earn good money while you're learning and there are always opportunities in trades. It's a pathway that can open a lot of doors.

Q: What do you think your younger self would make of where you are today?

Beth: Honestly, I probably wouldn't recognise myself. I once imagined taking a more traditional career path, but I've discovered that I enjoy working with my hands, solving problems and seeing the results.

Q: Your dad also works at QTMP. What has it been like working alongside him?

Beth: It's been great. We share lots of laughs. We don't spend every minute together, but it's nice knowing he's around and understands exactly what I'm doing.

Q: Steve, what was your reaction when Beth told you she had secured an apprenticeship?

Steve: I was thrilled. I'd been trying to join Downer myself for some time and the apprenticeship opportunity came up for Beth first. It felt like a win-win situation. Eventually I joined the team as the Torbanlea facility was opening; it's worked out well.

Q: What's it like working alongside your daughter?

Steve: It's special. We spend time together throughout the day, and it's strengthened our bond. We talk about work outside of work as well. I try to share some of my experience and give her advice, whether she listens to it or not is another story!

Q: Where do you think Beth's passion for the trade comes from?

Steve: Beth has always been someone who likes making things and working with her hands. She's very practical, very capable and she's able to turn her hand to all sorts of things. The opportunities available here are incredible. If you're willing to learn and grow, the sky's the limit.

Q: As a parent, what makes you most proud?

Steve: Seeing her focus on site, working on the trains, is fantastic. It's what every parent wants, really. Watching your child find something they're passionate about and succeed at it is a wonderful feeling. I'm incredibly proud of what she's achieved.

Q: What does the future look like for you, Beth?

Beth: I'm excited about what's ahead. QTMP has provided me opportunities I never expected, and I'm looking forward to continuing to learn, developing my skills and building a long-term career in the industry.

For Beth and Steve, QTMP is more than a workplace. It is where trains, careers and skills are being built—and where a shared passion for the trade is strengthening their family connection.

Engineering the future

“When I joined Downer as a graduate engineer, I never imagined I’d have the opportunity to help shape projects that will support communities for generations. That’s what excites me about rail. You’re not just solving today’s engineering challenges, you’re helping create the systems, technologies and infrastructure that will define how people move for decades to come.”

Australia’s rail industry is entering one of its most significant periods of investment and transformation.

Delivering new fleets, modernising infrastructure, advancing digital technologies and introducing new ways of operating rail networks requires more than engineering expertise. It requires the next generation of engineers, technologists and industry leaders.

Through graduate and apprenticeship pathways, Downer provides early-career professionals with the opportunity to work on real projects from day one, gaining experience across engineering, manufacturing, signalling, digital technologies, maintenance and asset management. Participants work alongside experienced rail professionals and contribute to some of Australia’s most significant rail programs.

Investing in emerging talent is an important part of building long-term rail capability. The engineers entering the industry today will help shape the fleets, infrastructure and technologies that support communities for decades to come.

From Graduate Engineer to Engineering Leader Sylvia Iskander’s career reflects the opportunities that exist within Australia’s rail sector.

After completing her Electrical Engineering degree, Sylvia joined Downer as a graduate engineer and has since built a career spanning asset management, systems assurance, reliability engineering, engineering leadership and major rail projects. Today, she serves as Electrical Engineering Discipline Manager, leading teams delivering complex engineering outcomes across Australia’s rail network.

Sylvia Iskander

ELECTRICAL ENGINEERING DISCIPLINE MANAGER

who started her career at Downer as a Graduate Engineer.

Sylvia Iskander with Downer’s Engineering Consulting team members. City Rail Link, Auckland

Downer

Rail and Transit Systems

140 Creek Street
Brisbane, Queensland 4000

2 Ellena Street
Maryborough, Queensland 4650

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