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OCTOBER 2023
Volume 54 Number 6



Published by:

Editorial and Publishing
Consultants Pty Ltd

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Publication No. 100001888

ISSN 0046-7391



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About the Cover

Image Linemarking was one of the first companies in Victoria to utilise TMAs (Truck Mounted Attenuators) to provide mobile work zone protection for its linemarking crews, and over the past 15 years, has purchased a total of eight Scorpion® TMAs, including the most recent unit - a Scorpion® II TL3 TMA - which was delivered at the end of September.

► Turn to **Page 10** for the full story.



PUTTING THE DATA TO WORK

USING THE DATA WE COLLECT TO DELIVER MAXIMUM EFFICIENCY, SAFETY AND VALUE

Dear Readers,

During the course of my work as Managing Editor of HEA magazine, I am fortunate enough to have the opportunity meet with people from across the roads, infrastructure, engineering and transport sectors to discuss a wide range of topics. As well as providing me (and hopefully you, our readers) with a valuable insight into the latest developments, technology, methodologies, materials and projects throughout Australia and internationally, it has also highlighted number of significant issues which seem to be affecting many within the road and transport infrastructure industries.

Of these, one extremely common problem - which has cascading effect through the majority of decision-making processes - seems to be that of accessing data that is both accurate and up-to-date.

More specifically, it appears that despite the enormous amount of resources and readily available data being collected (from incident reports, insurance claims, equipment purchases, maintenance works orders, etc.), there is still no readily accessible, easy-to-use, accurate and up-to-date central repository for data related to the cost of repair and/or replacement of damaged infrastructure and assets following road and transport accidents and incidents throughout Australia.

From the cost of new materials and replacement parts; and the cost of removal and disposal of damaged items, through to the cost of engineering; planning; work

scheduling; site labour; traffic management; and equipment (whether hired in or part of an 'in-house' fleet), even the most minor accident can result in a significant cost impost for councils, road authorities and other asset owners.

Notwithstanding the ever-increasing demands being placed on councils and road authorities to 'do more with less', having ready access to actual 'cost of incident'/'cost of repair' data is a critical factor in being able to select and implement the most cost-effective solutions.

After all, if you don't know where you are, how can you know where you're going?

When it comes to road infrastructure construction and maintenance, the importance of accurate and current data cannot be overstated. This is particularly true when it comes to the selection and installation of road safety infrastructure such as safety barriers, crash attenuators, frangible sign posts and other impact protection equipment which really **MUST** be assessed on a 'whole-of-life' cost basis. Only by having all of the relative data and costs at hand - from the initial capital purchase and installation cost, through to the cost of repair and/or replacement following an incident - can the 'true value' of these items be assessed.

In simple terms, a perceived initial saving, or for that matter, a badly researched choice that doesn't also consider 'whole of life' costs, can end up proving to be an enormous drain on infrastructure budgets.

Safety barrier and impact protection systems (both fixed and mobile devices such as Truck Mounted Attenuators) are, by their very nature, installed in locations where there is an expectation that they will be impacted - either rarely or regularly! With that in mind, it also follows that there must be an expectation that these devices will require repair and/or replacement at some stage in the foreseeable future. As such, accurate 'whole-of-life' costs must be taken into account during the decision-making process - and that requires access to data from out in the field.

This data is available. It is being collected across the country on a daily basis, every time there is an impact or accident anywhere on the road network. What we need is a coordinated approach to developing a centralised data repository that collates this data from the myriad of sources and makes it available easily, cheaply and on a timely basis to all stakeholders.

While I understand that establishing this type of database is not without a cost, I believe that the costs will be far outweighed by both the savings and safety benefits that can result from having accurate and up-to-date data readily available for all who need it.

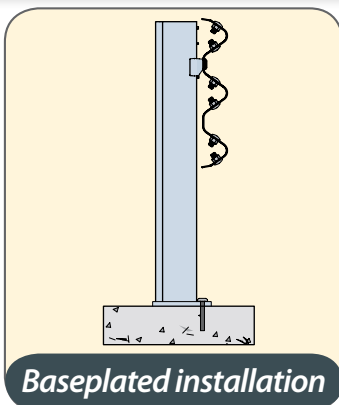


Anthony T Schmidt
Managing Editor

High-Containment Roadside Safety Barrier

Introducing Ezy-Guard High Containment, a member of the next-generation Ezy-Guard barrier family, providing superior motorist safety. Ezy-Guard HC is proven and crash tested to the latest MASH Test Level 4 standard, distinguishing it from all existing public domain guardrail barrier systems in Australia.

- Crash tested to MASH Test Level 4 – 10,000kg Truck
- Narrow footprint saving road width
- Easy to transport and simple to install
- Consideration for motorcyclists with rounded post corners
- Can be installed as a post-on-baseplate for areas where underground services restrict posts from being driven into the ground



Recognition for exceptional road safety achievements awarded at ARSC 2023

Road Safety professionals and practitioners were recognised for their research, community engagement, and a commitment for change with a global focus at the *Australasian College of Road Safety Awards* ceremony. The ceremony was held on Wednesday 20 September 2023, at the *2023 Australasian Road Safety Conference (ARSC 2023)* in Cairns, QLD, Australia.

Senator the Honourable Carol Brown, the Australian Assistant Minister for Infrastructure and Transport, addressed the audience, acknowledging the exceptional work by road safety professionals and practitioners who continue to strive for evidence-based road safety research, effective community engagement, and driving change at both local and global levels.

"Road safety is a matter that affects all Australians, each and every day," Assistant Minister Brown said.

"I thank you all for your contributions to road safety. I understand that a career in road safety is complex, challenging, and at times, confronting."

"Road Safety is a shared responsibility, and I am confident that together we can reach our target of Vision Zero by 2050," Senator Brown concluded.

Three unique ACRS Awards were presented during the ceremony by Senator Brown, supported by Professor Ann Williamson, President of the Australasian College of Road Safety.

ACRS Young Leader Oration Award

Dr Verity Truelove

The Australasian College of Road Safety Young Leader Oration Award recognises inspiring work and potential for future leadership

in the field of road safety. The 2023 ACRS Young Leader Oration Award, sponsored by Transurban, was presented to Dr Verity Truelove in recognition of her active involvement in research, community engagement and as an early career mentor for others working in road safety.

Dr Truelove is senior research fellow at the Road Safety Research Collaboration, a strategic partnership between the Motor Accident Insurance Commission (MAIC) and the University of the Sunshine Coast (UniSC). She is actively involved in research projects that address road rule compliance and behaviour change, with a focus on distracted driving, speeding and impaired driving. She has led the development of a formalised mentorship program for ACRS members and was invited to start the ACRS Early Career Network (ECN) for ACRS members across Australasia.

ACRS Women in Road Safety Award

Jessica Truong

The ACRS Women in Road Safety Award recognises the valuable role that women play in reducing road trauma. The award, sponsored by Austroads, was presented to Jessica Truong in honour of her commitment to improving road safety using technical knowledge, policy, strategy, and communication to deliver safer outcomes for all road users globally.

Ms Truong is the Secretary General at the Towards Zero Foundation based in London, which includes the Global New Car Assessment Program (Global NCAP). This role has allowed her to use her exceptional technical road safety knowledge, and her skills with policy, strategy, and communications to help advance the road safety journey of low-and-middle income countries.

She was a leader in the Towards Zero Foundation team which led the #50by30 campaign, one of the central advocacy collaborations in the lead up to the United Nations Resolution on Improving Global Road Safety in 2020, and led global projects to put road safety on the Commonwealth agenda which has resulted in active involvement in the Commonwealth Heads of Government Meeting.

ACRS Fellowship Award

Martin Small

The prestigious Australasian College of Road Safety Fellowship Award is presented in recognition of exemplary contribution being made by an individual ACRS member to road safety. The 2023 ACRS Fellowship Award was presented to Mr Martin Small in honour of his significant contribution to road safety through active leadership, management, and advocacy at the national and international level.

Mr Small has spent his career developing and providing policy and technical advice to improve road safety performance outcomes for the elimination of death and serious injury on road networks in Australia, New Zealand and developing nations in Africa, the Middle East, and in South-East Asia. He was the former President of the Australasian College of Road Safety between 2019 - 2022 and remains on the ACRS Executive Council as an elected representative today, and since 2019 has been a non-executive Director of the RAA in South Australia (both voluntary positions).

The Australasian College of Road Safety and members of the road safety community across Australasia congratulate Dr Truelove, Ms Truong, and Mr Small on their outstanding contributions to road safety.



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New End-to-End Mobility Solution for Persons with Visual Impairment Launched in Singapore

Hyundai Motor Group recently launched a pilot program in Singapore to demonstrate an indoor/outdoor navigation solution that assists persons with visual impairment. The Group is partnering with SG Enable, the focal agency for disability and inclusion in Singapore, and the Singapore Association of the Visually Handicapped (SAVH) on this initiative.

This pilot program in Singapore marks the second phase of the Group's Universal Mobility Project to better serve persons with disabilities through the broad application of its smart mobility solutions for end-to-end journeys. The Group has completed the first phase by launching EnableLA in Los Angeles, California, in 2021 to improve the transportation of people with mobility barriers, using wheelchair-accessible Hyundai Palisade and Kia Telluride SUVs.

The development of this assistive mobility solution aligns seamlessly with the Group's Smart City vision, which was unveiled at the 2022 World Cities Summit in Singapore. The vision depicts a future urban landscape that is centred around human values. It emphasizes the integration of diverse mobility solutions, including navigation features designed to address transportation challenges faced by persons with disabilities.

"In order to realize a smart city where every citizen can enjoy the freedom of mobility, it is necessary to develop an end-to-end mobility solution that supports the entire movement process, from pre-boarding to post-boarding of a vehicle," said Hyeyoung Kim, Vice President and Head of Smart City Innovation Group at Hyundai Motor Group.

"To make fundamental changes that achieve our goal, it will take collaborative efforts across the entire ecosystem, including the public and private sectors, not just by a single company," Hyeyoung Kim added.

For everyone's safety, work safely this October

Safe Work Australia encourages everyone to commit to building safe and healthy workplaces this National Safe Work Month.

National Safe Work Month is held every October and reminds us of the importance of work health and safety. No one should be injured, made sick or be killed by the work they do.

Work-related fatalities, injuries and illnesses have a big impact on individuals, their families and the broader community. Safe Work Australia data shows that each year up to 200 workers are fatally injured at work, and around 120,000 workers are compensated for a serious work-related injury or illness.

This year's National Safe Work Month theme – for everyone's safety, work safely – encourages all of us to prioritise safety in the workplace and work towards preventing work-related fatalities, injuries and illnesses. The theme highlights the various ways individuals and organisations can work together to protect workers' mental and physical health by eliminating and managing risks at work, and ensuring all workers are supported in a safe and healthy workplace.

"I encourage workplaces across Australia to take part in National Safe Work Month and commit to this year's theme – for everyone's safety, work safely," Safe Work Australia Chief Executive Officer, Michelle Baxter said.



"Creating a safe and healthy workplace that is free from physical and psychological harm benefits everyone, and that's what this year's theme is all about."

"All workers have the right to a healthy and safe working environment, regardless of their occupation or how they are engaged," Ms Baxter added. "National Safe Work Month is the perfect time to refocus on health and safety in the workplace and to commit to making WHS a central part of how we do business in Australia."

National Safe Work Month is led by Safe Work Australia and supported by initiatives across Australia from Safe Work Australia Members and their representative organisations, including Commonwealth, state and territory WHS regulators as well as employers and unions.

For more information and to access the National Safe Work Month resources, visit: <https://safeworkmonth.swa.gov.au>





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ITS Australia Global Summit sets the agenda for the Australian and international industry

The recent ITS Australia Global Summit in Melbourne has been hailed an overwhelming success by attendees and organisers. More than 1,000 international and Australian delegates attended the four-day event, hosted at the Melbourne Convention and Exhibition Centre. More than 300 speakers delivered Plenary, Panel and Specialists sessions and the comprehensive Technical Demonstrations and Tours were fully booked.

Presenters and delegates travelled from more than 22 countries, with at least 14 senior international transport executives attending, making the Summit the largest international ITS event in Australia since the 2016 World Congress.

ITS Australia President Dean Zabrieszsch said the Summit could not have gone any better.

"The feedback from attendees has been wonderful. It's been an all-round success in every aspect, from the speakers to the tours to the formal and informal networking opportunities.

"The ITS industry in Australia is world-leading and the Summit was our opportunity to show it off to the world.

"To see international colleagues make the long journey to Australia to connect, learn from us, and form partnerships in order to develop long-lasting working relationships, was very satisfying", Mr Zabrieszsch said.

The focus of the Global Summit was to explore approaches to accelerating smarter, safer, sustainable transport by leveraging the

ever-expanding capabilities of technology. It brought together government, industry and academic thought leaders from across the globe to discuss the themes of:

- Smart Infrastructure and Data Ecosystems.
- Sustainable and Equitable Transport.
- Electric, Connected, Automated Transport.
- Future Mobility.
- Policy and Harmonisation.
- Freight, Logistics and Drones.

ITS Australia CEO Susan Harris said delegates informed her the program content captured industry challenges, innovations and opportunities.

"Data, connectivity, and cooperation – these were recurring themes and three of the biggest topics at the Summit. They were referenced in nearly every presentation and conversation.

"Harmonisation of C-ITS and getting immediate real-world safety and efficiency gains from connected vehicles and networks was also front of mind for this international gathering.

"With so many Australian and global ITS professionals gathered in one place, the Summit created a foundation for transformational discussions that will provide the platform for nationally significant deployments that will provide a step change in road safety outcomes.

"We have connected Australian leaders with their international peers to support conversations on international harmonization, bringing forward deployment of real-time

safety messages for Australian travellers.

"For example, globally renowned ITS leaders such as Shailen Bhatt, Administrator of the US Federal Highway Administration (FHWA), who's responsible for 2,700 FHWA employees across all 50 states, U.S. territories, and the District of Columbia, and provides executive leadership on strategic initiatives and policies to President Joe Biden, attended.

"His participation not only critically informs fellow delegates of significant industry information, but it reinforces how well respected this Summit had become on the international calendar of must-attend events.

"We anticipate this ITS Global Summit will be the generator for many projects, pilots, partnerships and research topics for the sector going forward," Ms Harris said.

In addition to the main agenda, the Summit was also the backdrop for a number of focus groups. ITS Australia Policy Manager Stacey Ryan said just as Plenaries and Panels tackled the big Summit themes, workshops, such as Global Mobility, were an opportunity to deep-dive into specific challenges.

"The biggest through-line of the Summit by far was the laser focus on equity and inclusion – now firmly established as core to our sector and beyond.

"For example, Los Angeles Metro CEO Stephanie Wiggins, dissected how they were working to enhance communities and lives through mobility and access to opportunity. She also shared their LA Olympic Games 2028 plan that embeds equity and inclusion at all stages – great timing for our colleagues in Australia planning for the 2032 Olympics in Queensland," Ms Ryan said.

Susan Harris also acknowledged the significant contribution of the Global Summit Organising Committee for their commitment to ensuring the event's success.

"These things don't happen overnight and the planning for the Global Summit has been a few years in the making.

"The Committee was determined to not only provide an enticing and appealing line up of presentation topics, but to also ensure it was inclusive and diverse, which we achieved with our gender balance of speakers.

"The Committee also placed a large emphasis on creating both formal and informal networking opportunities, because for many delegates, these are where partnerships, joint ventures and pilot projects are instigated.

"The Committee did a fabulous job as did all our supporting partners, and of course, my team at ITS Australia," Ms Harris said.



Pictured L-R: Joost Vantomme - Chief Executive Officer, ERTICO-ITS Europe and Vice-President MaaS Alliance; Laura Chace - President and CEO, ITS America; Gretchen Newcomb - Director Partnerships, North America and Australasia, MobilityData; Professor Young-Jun Moon - Korea Advanced Institute of Science and Technology; Rita Excell - Head of Transport Australia and New Zealand, Amazon Web Services; Catherine Rooney - Executive Director, Mobility & Insights, and Co-Chair ITS Global Summit 2023, The Victorian Department of Transport and Planning; and Michelle Batsas - Director of Future Mobility, The Victorian Department of Transport and Planning at one of the Global Summit's numerous panel sessions.

Innovative technology could slash road maintenance costs

Technology out of Lincoln Agritech that is revolutionising road maintenance has been honoured at the KiwiNet Research Commercialisation Awards.

The TDRI sensing technology helps the road infrastructure sector extend pavement life and reduce maintenance costs with novel subsurface moisture detection technology. It was one of three finalists for the MAS Commercialisation Award, for delivering outstanding innovation performance and the potential for significant economic impact for New Zealand.

Subsurface moisture accelerates road deterioration by some 2.5 times. However, legacy methods for measuring subsurface moisture have been impractical and inefficient to apply across networks.

“Given the absence of network subsurface moisture data, road asset managers have been flying blind on a key factor causing road deterioration,” says TDRI CEO, Matt McNeill.

“This leads to band-aid fixes of surface level symptoms and unnecessary rework in the short term.”

TDRI's microwave sensing technology can non-invasively measure relative subsurface road moisture while travelling at speeds of up to 90 km/h.

The initial technology was developed by Lincoln Agritech, and then licensed to TDRI, a company formed in partnership with WNT Ventures.

Since then, it has been through further research and development. Pilot projects on New Zealand roads in 2022-23 have brought in \$390,000 in revenue – generating excitement from the companies and local authorities that have used it.

By providing subsurface data across the entire network, TDRI can reveal the root causes of problems, allowing longer-lasting fixes that result in significant road maintenance savings.

Matt says that with climate change increasing rainfall intensity and frequency globally, moisture-induced road damage is going to increase.

“The timing for this technology couldn't be more ripe,” , Matt McNeill said.

“We are seeing roads literally eroding before our eyes. The market desperately needs a solution to build resilience in our roads.”

Lincoln Agritech Business Development Group Manager Anya Hornsey says TDRI has great export potential for New Zealand.

“This technology solves a problem for road asset managers all over the world.”

“It has the potential for significant savings in road maintenance, while at the same time, boosting New Zealand's export earnings, and our reputation for innovation.”



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SCORPION® II TMAs PROVIDE CRITICAL MASH TL3 PROTECTION
FOR IMAGE LINEMARKING CREWS



Founded in early 1998 by director Craig Riley, Image Linemarking has grown to become one of Victoria's largest and most respected linemarking, roadmarking and road surface treatment specialist companies. Indeed, over the past 25 years, Image Linemarking has provided services to many major road construction companies, VicRoads and councils, working on projects of all sizes, including many of Victoria's largest high-profile infrastructure projects.



Scorpion II® TMA
Truck Mounted Attenuator



**TESTED, PASSED
AND ELIGIBLE**

While Craig's extensive experience in the linemarking industry, including his earlier work within the VicRoads (CRB) Traffic Linemarking section both as an operator and in various leadership roles, obviously played a major role in getting the company off to a successful start, it is also clear that a major contributing factor in Image Linemarking's continued success and growth has been his unwavering focus on safety and quality.

Put simply, safety and quality are the cornerstones and culture on which the company was built, and they continue to permeate through every aspect of the business. In fact, Image Linemarking was not only one of the first linemarking companies in Victoria to implement formalised Quality Systems, even before it became a requirement for contractors on many major projects, they were also one of the first companies to attain VicRoads prequalified contractor status at G2-LM, G2-STW level and TGS.

"From the outset, I wanted to ensure that we not only delivered the quality results that our customers expect – regardless of the size or the complexity of the job – but that we also set the benchmark in terms of safety," Craig Riley said.

"Protecting our work crews and providing them with the safest possible working environment has always been our number one priority."

"While any work zone that is exposed to vehicular traffic carries a significant risk, the mobile nature of linemarking work zones adds an additional level of risk, particularly along rural roads and major arterials where there can be a higher risk of motorists not obeying the work zone traffic controls," Craig added. "In those situations, even the slightest moment of inattention on behalf of a driver can have catastrophic consequences for a linemarking crew."

With that in mind, Image Linemarking was one of the first companies in Victoria to utilise TMAs (Truck Mounted Attenuators) to provide mobile work zone protection for its linemarking crews. Over the past 15 years, the company

has purchased a total of eight Scorpion® TMAs, including the most recent unit – a Scorpion® II TL3 TMA – which was delivered at the end of September.

"Interestingly, the first Scorpion® unit we purchased, was actually a Trailer Mounted Attenuator," Craig Riley explained.

"We had been purchasing linemarking equipment and supplies from A1 Roadlines for a number of years when they secured the distributorship for Scorpion® TMA products in Australia. At the time, they were also selling a Trailer Mounted Attenuator, which was suitable for low-speed worksites, so we purchased a unit for our fleet."

"Needless to say, we were so impressed by the design features of the Trailer Mounted Unit that we went on to purchase one of the truck-mounted units, and the rest, as they say, is history," he added.

SCORPION® II TMA PERFORMANCE BY DESIGN

Available exclusively throughout Australia from A1 Roadlines Pty Ltd, Scorpion® TMA's have proven their performance in the field in well over 2,500 documented impacts in the USA alone, as well as in numerous impacts across Australia and elsewhere around the world.

Fully tested, passed and approved to MASH TL3 standards (impacts up to 100 km/h by a vehicle weighing up to 2,270kg) and assessed, approved & recommended for acceptance throughout Australia by ASBAP (Austroads Safety Barrier Assessment Panel), Scorpion® II TMAs have been directly credited with saving the lives of motorists and site workers alike, while also reducing the severity of injuries suffered by vehicle occupants during impacts both in Australia and around the world.

The key to the Scorpion® II TMA's outstanding life-saving performance in the field lies within its unique modular design.

The Scorpion® II TMA consists of dual strut and cartridge sections that are linked together

on a support frame. Each energy-absorbing cartridge has an aluminium honeycomb core that is enclosed by an aluminium powder-coated box module that provides maximum durability and longevity. This dual-section open cartridge design (which folds up and over the host vehicle when not deployed) also offers the added benefits of reducing wind resistance and increasing fuel efficiency when travelling to and from job sites at highway speeds.

Designed for maximum visibility, the Scorpion® II TMA is equipped with LED brake, directional, signal and running lights, as well as all reflective markings (as required under VSG-11) to further enhance advanced warnings to drivers.

When impacted, the Scorpion's modular design crushes in progressive stages, which not only reduces the impact forces on the vehicle's occupants, but also results in lower repair costs and easy parts replacement. The unit's curved design side rails are made from corrosion-resistant aluminium tubes and offer full-width impact protection along the entire length of the TMA, safely redirecting the impacting vehicle away from the deadly "coffin corners" at the rear of the truck.

"Our Scorpion® TMAs are a critical front-line tool for keeping our work crews safe," Craig Riley said. "They are extremely well designed, easy to use and reliable, which is also a critical factor in terms of us being able to complete our work as scheduled."



MODULAR DESIGN DELIVERS OUTSTANDING 'WHOLE-OF-LIFE' VALUE

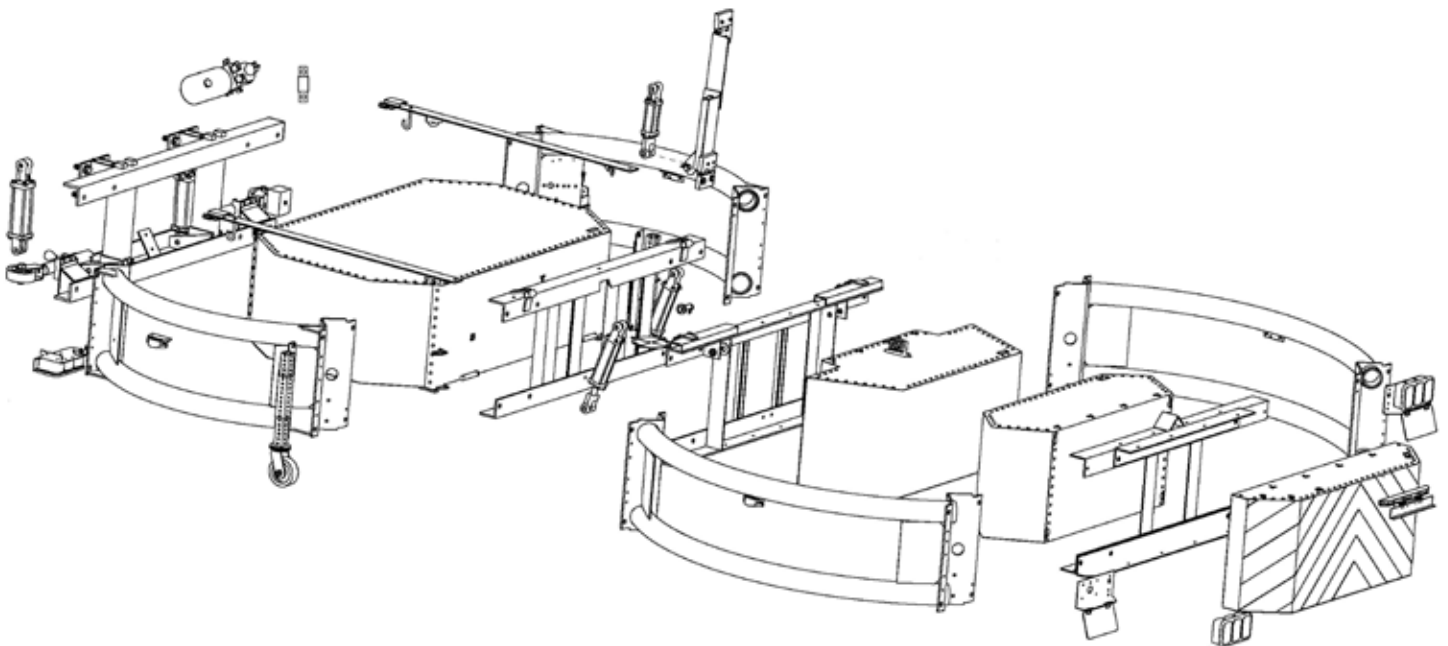
As well as playing a significant role in its performance during an impact, the Scorpion® II TMA's 'modular' design also plays a major role in helping to reduce the cost of repairs (particularly after moderate impacts and/or in the event of accidental damage) with only the damaged components requiring replacement.

With most non-modular units, even minor damage caused by a driver inadvertently reversing into an object or colliding with a stationary object while positioning the vehicle, can have extremely costly consequences. In fact, with some units, even minor impacts can result in having to replace the majority of the TMA unit.

Needless to say, with very low speed and minor impacts accounting for around 80% of the total impacts into TMAs, the cost and inconvenience of having to replace an entire unit or the majority of a unit any time minor damage occurs can be considerable.

The Scorpion II TMA units are extremely quick and easy to repair, and with the greater majority of repairs coming in at only a fraction of the cost of a replacement unit, they deliver outstanding 'whole-of-life' value, both in terms of parts and repair costs and minimising critical equipment downtime.

Importantly, even after most 'medium severity impacts', the Scorpion II TMA only generally requires the replacement of one or two of the 'cartridge' sections and, depending on the angle of impact, a set of aluminium side deflection bars.



QUICK & EASY TO DEPLOY

The Scorpion II TMA is extremely easy to use and fast to deploy in the field.

Available to suit a wide variety of vehicle types and models, the Scorpion II TMA's compact design and balanced weight distribution minimises the impact on vehicle handling, while its 'fold-over' design helps to minimise the total vehicle height while in transit to and from the work zone, without having to compromise on performance in the field.



AVAILABLE FOR A WIDE RANGE OF HOST VEHICLES

While the new Image Linemarking unit has been supplied on a Fuso Fighter 1627 host vehicle, A1 Roadlines is able to supply the Scorpion® II TMA on a wide range of cab-chassis models from leading manufacturers including ISUZU, UD, FUSO and HINO to name a few. Trucks are also available in a range of body and wheelbase configurations to suit any application.

For further information, contact:



A1 ROADLINES PTY LTD
P: 1300 217 623 (1300 A1ROAD)
E: sales@a1roadlines.com.au
www.a1roadlines.com.au



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2



3



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ENGINEERING SOLUTIONS FOR A SUSTAINABLE FUTURE

In a world grappling with the consequences of climate change, biodiversity loss, and extreme weather events, engineers have emerged as champions of innovation and sustainability, says Engineers Australia CEO Romilly Madew AO.

“The battle to combat climate change has well and truly entered its engineering phase. The profession’s expertise, innovation, and dedication are central to ensuring a more resilient and sustainable world, and the upcoming *Engineers Australia Climate Smart Engineering Conference* (CSE23) will bring together the greatest engineering and innovative minds from across Australia.”

Now in its third year, the peak body’s flagship event will be held at the Melbourne Convention and Exhibition Centre on 29 and 30 November 2023, ahead of COP28.

Madew says that since its foundation in 2021, CSE has become a focal point for discussion and knowledge sharing.

“CSE22 explored the ways engineers can navigate the complexities of achieving net-zero emissions and drive the transition to a clean energy economy,” she explains.

“This year’s full technical program and plenary sessions will provide attendees

with the latest world-leading perspectives and engaging debates on solutions to address climate change, respond to extreme events, address biodiversity loss, boost the circular economy, and uphold the principles of sustainable practices in engineering.”

At CSE23, experts will discuss the latest advancements in climate-smart engineering, emphasising the importance of sustainable energy sources and emissions reduction strategies.

“The conference’s technical program includes a diverse range of sessions and workshops that cover various aspects of climate-smart engineering. Attendees can expect to explore topics such as sustainable building design, renewable energy integration, conservation engineering, and climate-conscious urban planning. These discussions are vital for engineers seeking to stay informed about the latest advancements and strategies in their field.”

CSE23 also offers a unique opportunity for networking and relationship-building. Engineers and professionals from diverse backgrounds can connect, share insights, and establish valuable partnerships. These connections often lead to collaborative efforts on projects that address the most pressing challenges facing our planet.

“The role of engineers in addressing climate change, biodiversity loss, circular economy integration, sustainability ethics, and disaster resilience cannot be overstated. The decisions we make today will shape the world of tomorrow,” Madew stresses.

“CSE23 serves as a testament to our commitment to a more sustainable and resilient future. It is a reminder that we are not alone in this endeavour; we are part of a global community of problem-solvers dedicated to engineering solutions that benefit both humanity and the environment.”

CLIMATE SMART ENGINEERING CONFERENCE

29-30 November

Melbourne Convention and Exhibition Centre

Register now to join Engineers Australia and connect with like-minded professionals at the must-attend sustainability conference of 2023

engineersaustralia.org.au/cse

CSE23 PLENARY PROGRAM HIGHLIGHTS

Calling for engineers to work on the largest economic transition since the dawn of agriculture - Dr. Alan Finkel AC, previously Australia's Chief Scientist

Engineers will design the technological solutions and their deployment. Engineering education and practices must reflect this responsibility to minimise adverse impacts without shifting them elsewhere.

Panel discussion - How can organisations overcome the engineering skills shortage that might inhibit progress?

Engineers Australia Chief Engineer Jane MacMaster leads the discussion with a focus on education, recruitment and retention, skilled migrant participation, and demand forecasting.

Dr Margie Warrell, Best-selling Author of Stop Playing Safe

There is no singular pathway or roadmap to creating a more sustainable world. Forging new ground and finding smarter solutions requires courage and taking smart risks, not just safe ones.

The crucial role of technology and innovation on the path to net zero

Join Larry Marshall, former CEO of CSIRO in conversation with Engineers Australia CEO Romilly Madew AO as they explore the challenges facing engineers in realising real world solutions for mitigating climate change and achieving net zero.

Navigating transition and transformation in all parts of our economies

Zoe Whitton, Managing Director and Head of Impact, Pollination.

The engineering mindset - making change happen

Eytan Lenko, CEO, Boundless Earth, explores the challenges organisations face in decarbonising, and how engineers can be central to change.

The circular economy as an accelerator

Lisa McLean, CEO, Circular Australia, explores how Australia is driving the evolution to a circular economy.

Prof John Thwaites AM, Chair, Monash Sustainable Development Institute and Chair, Climateworks Centre, explores the biggest opportunities for circular economy intervention in circular design, built environment and innovation. Are we on track for a more circular economy by 2030? John is Chair and Lisa a member of the Federal Government's, Circular Economy Ministerial Advisory Group.

A just transition - embracing Indigenous approaches in the energy transition

Ruby Heard, Director, Alinga Energy Consulting discusses the need for an energy transformation that embraces new approaches to all aspects of the energy delivery system. Indigenous values and knowledges have much to offer as we reimagine and create the energy system of the future.

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TELEMATICS DATA STREAMLINES SUPPLY CHAIN

The automated tracking of empty freight containers can improve turnaround times by more than 30 per cent.

A collaborative Victorian project, using data supplied by Transport Certification Australia (TCA), has demonstrated that empty container parks with high levels of automation are significantly more efficient than those that use paper forms to track vehicles.

The trial, commissioned by the Department of Transport and Planning Victoria, studied automation levels at empty container parks in Victoria, aiming to better understand the benefits of paperless and contactless truck arrivals.

Keeping, carrying, matching and exchanging paper forms at gatehouses can be a major cause for delays and loss of efficiency. The study found that empty container parks with medium and high automation levels can experience 20 to 32 per cent faster truck turnaround times compared to those with low automation levels.

As part of the study's outcomes, Freight Victoria has developed new performance indicators for truck turnaround times, which will help provide greater visibility of the performance of the supply chain.

TCA's data insights on truck movements and turnaround times were used to calculate key metrics for the impact of automation in truck arrival processes, including estimating the number of trucks visiting the participating empty container parks.

"This is an excellent example of how TCA's data and work results in tangible decisions by government and genuine improvements to the efficiency of one of our economy's most important industries," said John Gordon, Manager Strategic Development at TCA.

TCA provided data about the movement of high-productivity freight vehicles enrolled in an application of the National Telematics Framework. TCA's data was based on Global Navigation Satellite System records within geo-fenced site boundaries.

The study found that empty container parks with medium and high automation levels can experience 20 to 32 per cent faster truck turnaround times compared to those with low automation levels.

As the National Telematics Framework administrator, TCA frequently provides aggregated, anonymised data extracts to support stakeholder research projects and can also combine data from other sources. TCA's Telematics Analytics Platform is another source of data analytics that supports authorities, including road managers and policymakers with secure access to telematics data analytics for improved road safety, transport efficiency, freight productivity, asset management and sustainability.

DOWNLOAD A COPY

To download a copy of the report 'Empty Container Park Trial - Moving towards paperless and contactless truck arrival at Melbourne's empty container parks' SCAN THE QR CODE or visit: <https://tca.gov.au/news/telematics-data-streamlines-supply-chain>



Whether it's a TL-2 or TL-3 attenuator, your first question should always be: **IS IT MASH APPROVED?**



With the ASBAP (Austroads Safety Barrier Assessment Panel) guidelines now requiring all new TMAs sold for use in Australia to be tested and approved to MASH Standards, one of the most critical questions for equipment purchasers to ask is: **"Is it MASH Approved?"**.

When it comes to **Scorpion® TMAs**, the answer is a resounding **YES** – for BOTH TL-2 and TL-3 attenuator.

In fact, the Scorpion II® Metro MASH TL-2 TMA is not only **THE FIRST TL-2 TMA** to be fully tested and approved to the latest MASH Standards, it is currently **THE ONLY TL-2** Truck Mounted Attenuator to be successfully **TESTED, PASSED & ELIGIBLE** to the current MASH Standards.

So, whether it's TL-2 or TL-3, when it comes to selecting a fully MASH tested, passed and eligible TMA that has also been **ASSESSED, APPROVED & RECOMMENDED FOR ACCEPTANCE** throughout Australia by ASBAP, the only name you need to remember is Scorpion® from A1 Roadlines.



THE EQUIPMENT YOU NEED – THE SERVICE YOU EXPECT

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GET HOME SAFE

Australia's leading designer and manufacturer of high pressure water blaster equipment is launching an updated version of their FREE Safety Training Course, "Aussie Blaster Safe Operator Training".

Australian Pump Industries has long been concerned with safety for operators of high pressure cleaners. The Aussie Pump range of pressure cleaners, sold not only in Australia now but globally, has set new standards in the safe design of high pressure cleaning devices up to 500 bar (7,300 psi).

As the product range expanded and received domestic and export attention, the company realised that safety in the use of the equipment is an essential part of the package.



When the Safety Standards were introduced to protect operators in the workplace from potential serious injuries, training courses for Class B operators became compulsory.

"Although Class B operators are mandated to undertake formal training and certification, we know there are hundreds, if not thousands, of operators using Class A machines without training of any kind," said Aussie's Chief Engineer, John Hales.

Aussie Pumps produced their own training program for Class A operators, "Aussie Safe Operator".

Their original training course proved so popular, that constant improvements are necessary to keep up with new product developments.

The course is aimed at operators of high pressure water blasters of all types and brands.

"It's our contribution to the industry," said Hales. "We provide this free training program to users, and we don't really care what brand of machine they're operating."

"The idea is to help keep them safe, in the confidence that sooner or later, they'll realise we make better machines than anybody else!" he said.

Aussie intends the course to be valuable to operators and supervisors who need suitable pressure cleaning safety training.

"We listened to feedback from users, and realised there were some extraordinary risks being taken by untrained operators," said Hales. "For example, using a pressure cleaner from a ladder is risky."

"Our aim is to prevent injuries by training operators to identify hazards and in understanding how the equipment works."

The training course explains how the product works, with particular attention being paid to the



relationship between pressure and flow of the pump, the safe use and setting of the unloader, and the size of the nozzle in the lance of the operator's gun. Understanding the components of the system and how they all work together is indispensable for safe operation of the gear.

Further information on Aussie's complete range of high pressure cleaners in both hot and cold versions, is available from Australian Pump Industries. Call +612 8865 3500 or visit the website: <https://aussiepumps.com.au>

Scan the QR Code or visit aussiepumps.com.au to view the "Aussie Safe Operator" course online.



Aussie invites all users of pressure cleaners, irrespective of brand, to complete the course online at <https://aussiepumps.com.au>

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What you need to know about Digital Traceability

Demand for digital product traceability is heating up - and construction is next



Globalisation has brought many benefits, including in quality and pricing, a larger marketplace, and diversified supply. But it also has its challenges, not least a lack of understanding of local legislative requirements (e.g. understanding code requirements), and an increased carbon footprint for longer logistics journeys.

Additionally, complex procurement means risks and uncertainty over products' origins, quality, compliance, and related assurances.

The problems caused by the lack of visibility and assurance of fact through the supply chain are driving global demand for digital product traceability to international standards. End-consumers and responsible businesses want certainty when it comes to safety and quality, as well as ESG performance.

In construction, with the push to optimise process efficiencies and ensure compliance with local regulations, digital traceability from source to end product is being seen as a game-changer.

TRIED AND TESTED

Many industries have successfully introduced forms of digital product traceability. In textiles, the end consumer previously had no visibility over the early stages of the supply chain. But as customer expectations rose – primarily around fair trade, and more recently for assurance around other ESG factors – the industry introduced better traceability so the end user can now determine the origin of garments.

In the grocery store, to improve efficiency we moved from counter service to self-service, and then added barcodes for better customer access. These barcodes, which use global standards, also provide the traceability to ensure our foods are safe, responsibly sourced, and of the desired quality.

In the automotive industry, where safety is also a primary concern – followed closely by cost – traceability is used to drive efficiencies across a complex manufacturing process and to assure end-user safety.

In the production of a car, parts are sourced from across the globe, with unique markings at component level to ensure traceability throughout manufacture. This tracking enables specific recalls in the case of faults, thus giving the user confidence in the end product.

PROTECTING CONSUMER CONFIDENCE

We can see from industries that have already adopted the process, that digital traceability has numerous benefits including:

1. Validating safety and quality of products – good for end-users and any liable parties
2. Optimising processes – good for manufacturers
3. Improving ESG performance – good for everyone
4. Increasing consumer confidence.

On the last point – consumer confidence – transparency and trust are the key issues. We've seen several examples in recent years where transparency and trust were missing or broken, and consumer confidence quickly followed.

At the beginning of 2018, a major steel manufacturer from Japan admitted to supplying products with falsified test reports for decades. Supply chains all over the world were affected, and the company lost years of customer trust.

Similarly, major automotive companies were caught deceiving customers regarding emissions testing. In both these situations, not only was the principal company affected but also companies that used them as suppliers.

SAFE AS HOUSES

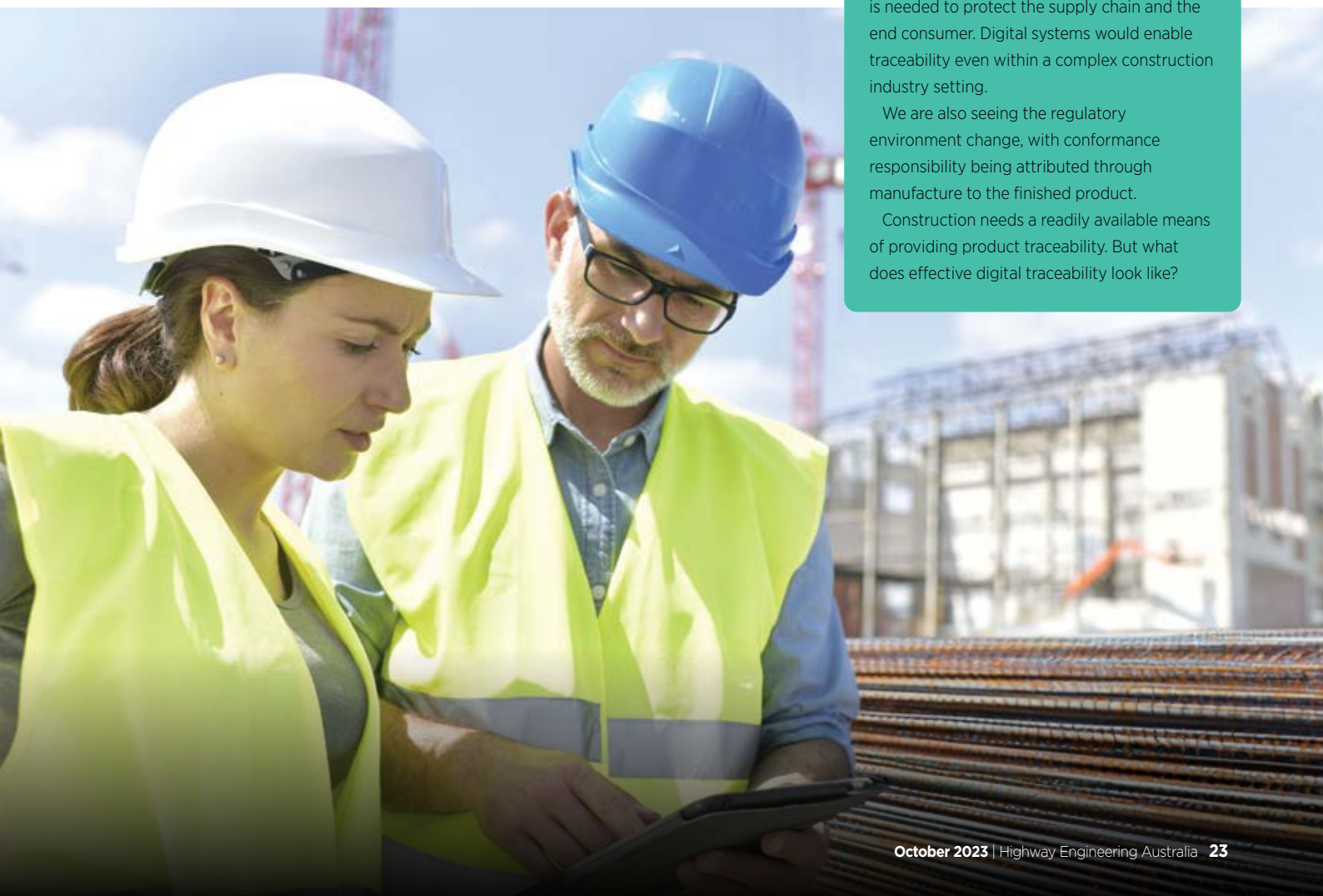
Construction is certainly not immune to such issues. Like the automotive industry, construction has long complex, global supply chains that source parts and components from multiple suppliers. Safety is paramount: compliance of products and materials is of major concern, and demonstration of safety is a legal requirement.

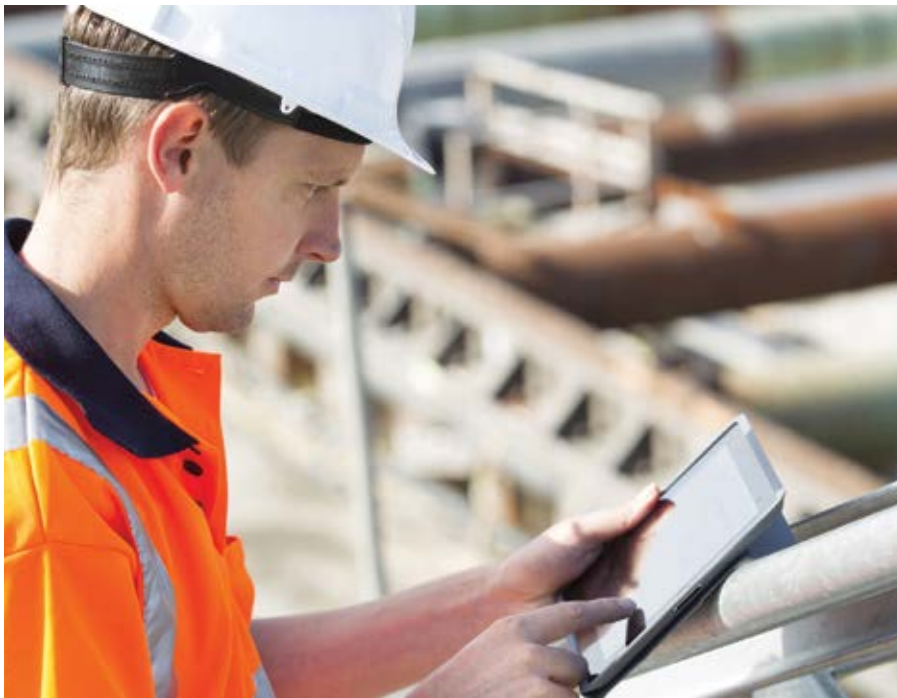
However, construction provides more complexity in supply chains and service providers than other industries, and yet, to date, we have not seen widespread adoption of digital product traceability. The current systems, being primarily paper-based, remain open to fraudulent behaviour – which in turn reduces confidence in the conformity of materials and products. As a result, the industry has seen unfortunate recent and historic examples of these shortcomings.

Inquiries have been held regarding a number of concerns, including Grenfell Tower in the United Kingdom; Lacrosse Tower; Opal and Mascot Towers in Australia, and E-Class mesh in New Zealand. Findings suggest that knowledge and understanding of material and products, and demonstration of conformance, are paramount. They suggest that traceability is needed to protect the supply chain and the end consumer. Digital systems would enable traceability even within a complex construction industry setting.

We are also seeing the regulatory environment change, with conformance responsibility being attributed through manufacture to the finished product.

Construction needs a readily available means of providing product traceability. But what does effective digital traceability look like?





GLOBAL TRUST ANCHORS

Digital traceability systems have been around for some time, but in a complex environment such as construction, linear systems don't easily provide access to the information sought. Work is currently being conducted on the global stage that considers "trust anchors" and "verifiable credentials".

A trust anchor is a point along the supply chain providing assurance, from a verified and trusted source, that the product is compliant with a particular aspect. Typically, the trust anchor would not hold all information about a product, but instead act as a pointer to enable traceability and access to the information required.

An example of a familiar tool that acts as a trust anchor would be the apps used for two-step authentication. Without the input of any personal information, the app provides verification for the user to proceed.

STEELY CONVICTION

Steel is one of the most important materials in construction. Despite that, we regularly see:

- a huge variance in quality (performance characteristics) and consistency;
- consignments delivered with mixed supply (is it all compliant?); and
- steel delivered that doesn't conform to local standards.

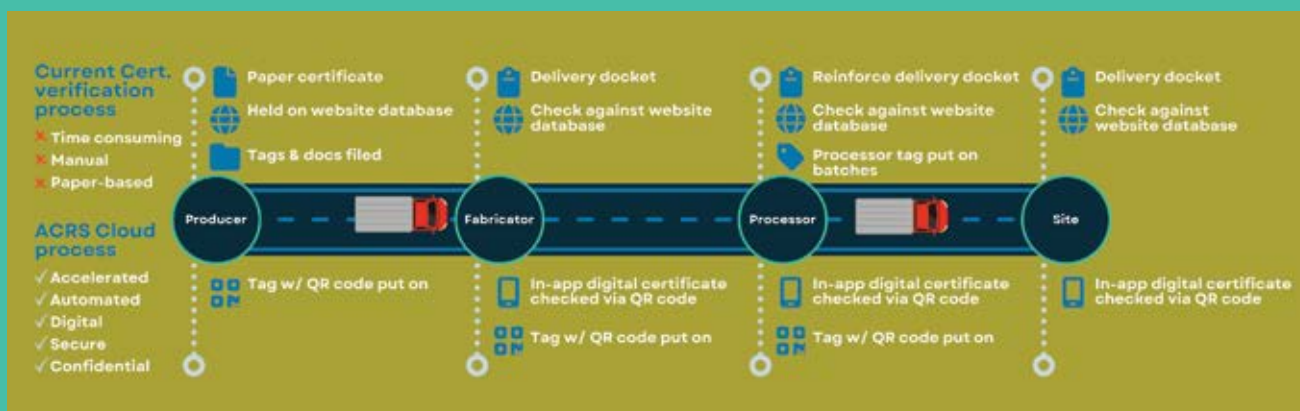
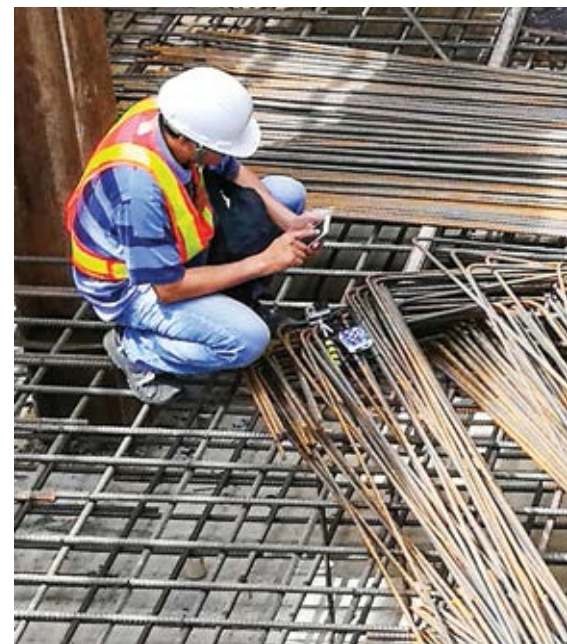
Fake or misleading paper test certificates are common, showing results for a different product, or supplier, or are falsified. We have found fraudulent certificates on steel consignments on-site on major infrastructure and construction projects, as well as steel with inappropriate product markings and inadequate traceability.

The answer to overcoming these challenges is rigorous independent certification from

mill to site, the kind provided by ACRS – Australasia's leading steel certifier.

The ACRS scheme provides effective product certification, ensuring quality and compliance along with the legislated traceability through the supply chain. To achieve this traceability, ACRS certifies steel both at manufacture and at processing. ACRS has been providing this traceability for more than 20 years, including the use of web-based verification methods.

Recognising the industry move to digital systems and to ensure this confidence in the ACRS scheme is maintained, ACRS has launched ACRS Cloud - a digital verifiable conformance scheme. By combining certification and digital product traceability, ACRS will be a trust anchor, providing confidence and traceability to the market.



ACRS CLOUD

ACRS Cloud is the first digital certification system of its kind for steel in the Australian and New Zealand construction industries. ACRS Cloud gives steel buyers and users instant assurance over product certificates at the touch of a button, in a secure environment, to provide confidence in products' conformance to AS/NZS Standards.

Users through the supply chain can get product peace of mind by checking the nature and authenticity of ACRS steel certificates in the new ACRS Cloud app – available free on Apple and Android.

The app further protects the market from product compliance issues: The ACRS Cloud system will see batch-specific tags with QR codes put onto steel at steel producers, fabricators, and processors. At each point, these QR codes (and/or those on ACRS certificates) can be scanned onsite to instantly identify the

source of a product and its certification details against a 'single source of truth', including batch number; bar and tag markings; and verification of product conformance to provide full traceability through the supply chain.

Just like via the ACRS online database, you will be able to search for certificate holders by mill name or country, and report any concerns, all in the app. Simply:

1. Download the ACRS Cloud App
2. Scan the QR code on delivery papers or electronic certificate
3. In the app, select the ACRS ID of the certificate
4. View the certificate in full, including scope, origin, and key dates.

For certainty over the steel you use, make sure you are specifying ACRS-certified steel, and checking conformance easily in the new ACRS Cloud app. Find out more at:

<https://steelcertification.com/cloud>



ASSURANCE IN YOUR HANDS: WHEREVER, WHENEVER

In order to make product traceability more secure and accessible, ACRS certificates will carry QR codes which – when scanned – will open validation and vital product information in ACRS Cloud.

The app will put assurance in users' hands wherever and whenever they need it, including bar and tag markings; where the product has come from; and its validity and its assurance credentials in the form of ACRS' sector-leading independent certification. Just like online, you will be able to search for certificate holders by mill name or country, and report any concerns, all in the app. Available on Apple and Android, the app is completely free to download and use.

1: DOWNLOAD THE APP



2: SCAN QR CODE

on delivery paper / electronic certificates



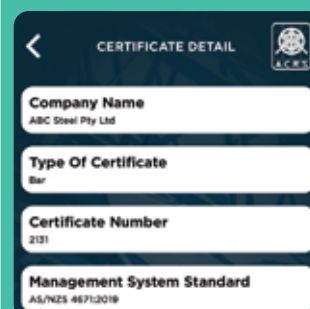
3: SELECT ACRS ID

of certificate in app



1: VIEW CERTIFICATE

inc. scope, origin, key dates



The app further protects the market from product compliance issues: not just in poor product identification or deliberate misrepresentation, but by making it easier for users to check steel's provenance at every stage. It also supports best practices for those seeking sustainable steel.



« INNOVATIVE 'LOW STRESS' DESIGN

With its innovative design and patented 'post/fuse' system, DOLRE 'Regular' barrier delivers MASH TL4-rated protection while limiting the maximum transverse force transmitted to the bridge deck to less than 44 kN/post (22 kN/metre), which equates to only 14% of the ultimate outward transverse design load as per AS5100.2-2017.

What's more, at around 120 kg/m installed, DOLRE bridge traffic barriers are significantly lighter than many AS5100 'Regular' / MASH TL4-rated barrier alternatives.

SEAMLESS PROTECTION WITH DOLRE TL4 TRANSITIONS »

DOLRE transitions have been designed and tested to provide full longitudinal load transfer between the bridge traffic barrier and connecting roadside barriers.

The DOLRE 'Regular' barrier, together with the DOLRE transitions and Thrie-Beam barriers create an engineered continuum of MASH TL4 protection – delivering maximum safety for road users onto and across the bridge structure.



« WHERE PERFORMANCE AND AESTHETICS MEET

DOLRE's clean, uncluttered lines and aesthetically pleasing design make it an ideal match for a wide variety of bridge designs and locations. The design allows for rapid installation, as well as rapid repair and reinstatement of the barrier following an impact. DOLRE is also easy to dismantle and remove in times of flood, thereby helping to significantly reduce the risk of damage to valuable bridge assets caused by flood-borne debris.

DOLRE is also available with an extensive range of standard or custom fascia designs and integrated lighting options.

CHOICE OF PERFORMANCE LEVELS »

Available in a range of AS5100-2017 performance levels, including DOLRE Low (MASH TL2 | EN1317 N2), DOLRE Regular (MASH TL4 | EN1317 H2) and DOLRE Medium (MASH TL5+ | EN1317 H4b), there is a DOLRE barrier to suit virtually any bridge, culvert or road embankment application.

All DOLRE systems feature three rails - two rails for the initial vehicle impact and one rail to resist rollover – and one post design per system type, suitable for both sides of the bridge.



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THE REVOLUTION IN BRIDGE SAFETY UPGRADES

Ideal for bridge refurbishment and safety upgrade projects, DOLRE's ground-breaking 'low stress' design restricts the outward transverse force transmitted to the bridge deck during a vehicular impact to a fraction of the bridge deck's capacity, thereby minimising the risk of damage to the bridge deck and structure during a vehicular impact.

DOLRE bridge traffic barriers can play a significant role in extending the serviceable life of many existing bridges - delivering AS5100 and AS3845 compliant protection without the need for expensive deck strengthening works or additional reinforcement.

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MUNRO PREVEWS DESIGN AND TECHNICAL UPGRADES FOR ALL-ELECTRIC SERIES-M 4X4

Munro Vehicles (Munro), a manufacturer of all-electric 4x4s, and Scotland's only volume production car company, has revealed details of design and technical enhancements for its all-electric 4x4 Series-M Pick-Up and Series-M Truck models, driven by extensive field trials of, and customer feedback on, the Munro MK 1 pre-production model.

The Munro Series-M is a ground-breaking electric-powered, four-wheel-drive workhorse that combines the rugged reliability and repairability of a full-time 4x4 mechanical drivetrain with a state-of-the-art electric powertrain, ensuring zero tailpipe emissions. The vehicle is offered in 'standard' M170 170kW and 'high-power' M280 280kW guises and in Pick-Up and Truck configurations.

While the first, pre-production iteration of the Munro Series-M, referred to as the Munro MK_1, has already been successfully previewed to the media and customers, Munro has taken onboard feedback gained during extensive field trials in the Scottish Highlands and implemented numerous design and engineering upgrades.

"Revisiting how some of the major components were packaged allowed us to enhance the aesthetic and technical aspects of the Munro Series-M Truck and Pick-Up," explained Munro Head of Design, Ross Compton. "We have created an even more distinct design that builds upon the Munro name while introducing improvements to areas such as aerodynamic and cooling performance and efficiency."

The Munro Series-M now features a more streamlined and lighter front end, allowing greater forward visibility. The transition to superior body panelling now means that components can be more easily replaced, further bolstering the all-electric 4x4's ability to provide a lifetime of service.

At the rear, an 'exoskeleton' mounted on the hard top on Utility specification models enables easy mounting of equipment, an asset for those operating in sectors Munro is targeting, such as agriculture, construction, outdoor maintenance, disaster relief, rescue, mining, and defence.

Responding to customer feedback on its early demonstrator vehicles, Munro has also introduced an adjustable steering column with steering wheel controls, plus a raft of ergonomic enhancements that include improvement of the seat rake and height adjustment. A full suite of safety equipment, including airbags, ABS brakes, stability and traction control, is now offered.

"We have introduced a more durable, longer-lasting LFP (Lithium Iron Phosphate) battery pack that provides a faster 30-minute, 130kW rapid charging time," explained Munro Co-Founder and Head of Powertrain Director Ross Anderson.

"We have also significantly improved the thermal efficiency of the vehicle. Waste heat, scavenged from the drivetrain, can now be used to heat the cabin. Combined with more effective sound deadening measures, the Munro Series-M now makes for a more comfortable travelling

ABOUT MUNRO

Munro Vehicles was founded in 2019 by Russell Peterson and Ross Anderson to manufacture the Munro® Series-M, the world's most capable all-electric 4x4, for commercial and private customers. Born off-road, the Munro is a unique 4x4 with uncompromising capability in the most challenging environments with the lowest environmental impact.

Scotland's only production car company, Munro Vehicles, will build 50 vehicles in 2023 before transitioning to a new purpose-built site near Glasgow in 2024. With the creation of 300 new jobs, production will be ramped up to 250 vehicles per year with a strategic roadmap in place to deliver 2,500 units annually by 2027.

The Munro is cleverly engineered to be simple and low-cost to maintain, with the extensive use of existing components. This approach ensures a superior total cost of ownership, with maximum uptime from a fully electric 4x4 that minimises its footprint no matter where it goes.

experience, whether it is being driven on tarmac for a range of up to 320 kilometres or traversing the most challenging off-road terrain in the world that it was designed to conquer."

Designed, engineered, and proudly built in Great Britain, the Munro is a historically important vehicle, marking the first light vehicle to enter production in Scotland in over four decades.

More than 250 pre-orders for both the Truck and Pick-Up models have been received, affirming that Munro's vehicles are precisely what the market needs, particularly in sectors such as mining, construction, utilities, agriculture, and defence, where radical solutions are required to enable operators to meet their decarbonisation targets.

Munro is poised to seize the significant global market opportunity with the support of financial partners as the company nears completion of its first two production models. With Munro's commitment to innovation and clean-sheet design, the Series-M promises to be a game-changer in the world of electric workhorse vehicles.

EVIE NETWORKS PARTNERS WITH IKEA TO BRING FAST CHARGING SOLUTIONS STORES

Evie Networks, the largest national ultrafast Electric Vehicle (EV) charging network, and IKEA Australia, recently announced the installation of fast charging stations at IKEA's Tempe store in Sydney's inner-west. The new charging stations will provide customers with a fast EV charging option whilst they shop.

The charging solution at the IKEA Tempe site will feature two 150 kW concurrent chargers, making it the fastest charging option available at any IKEA store in Australia. IKEA's commitment to providing diverse charging options ensures that customers have access to chargers that cater to their specific needs and use cases.

IKEA Australia is committed to its sustainability goals and has been providing charging infrastructure to support customers with electric vehicles since 2019. The home furnishing retailer also has electric vehicles in its fleet, which are reducing the company's environmental footprint for home deliveries.

Evie is dedicated to creating an extensive network of fast charging stations, strategically placed with convenience and everyday amenities in mind for EV owners. The new charging site at IKEA Tempe will be a significant addition to this growing network, providing an essential charging

solution for not only IKEA customers, but also adding an easily accessible charging location to a highly populated urban area.

Evie Networks Chief Operating Officer, Geoff Brady, said that retail, business and property owners are an important partner in providing solutions to support the increasing demand for accessible, everyday charging.

"We are excited to include IKEA in a growing public network that allows drivers to recharge where they shop, work and play. Making fast charging a seamless part of customers' shopping experiences will help advance our mission to accelerate the adoption of EVs in Australia.

"Our reliable fast and ultra-fast network is particularly important for drivers without off-street charging, and for businesses looking to transition their fleet. If we want to move towards a cleaner transport future, people need to be confident that they can charge whenever and wherever they need."

Alexandra Kelly, Zero Emissions Delivery Lead, IKEA Australia, said that supporting customers with zero emissions transport solutions is a key part of the IKEA sustainability agenda.

"At IKEA Australia, we have a responsibility to not only improve our own operations to lessen



our impact on the planet, but also to inspire and enable our customers to live a more sustainable life at home."

"Offering flexible EV charging solutions for our customers to park, charge and shop with the charging duration that suits them is a great way we can do this. Together with Evie, IKEA aims to provide an efficient charging experience, complementing the existing charging infrastructure already at the IKEA Tempe store."

Evie's partnership with IKEA follows successful collaborations with prominent retail brands such as Endeavour Group, Craveable and Hungry Jacks. These partnerships have significantly contributed to the acceleration of EV adoption among customers and fleet partners, with IKEA recognising the sustainability and business benefits of transitioning to electric vehicles for delivery purposes. This project received funding from ARENA as part of ARENA's Future Fuels Fund.

For more information about Evie Networks, please visit: <https://evie.com.au>

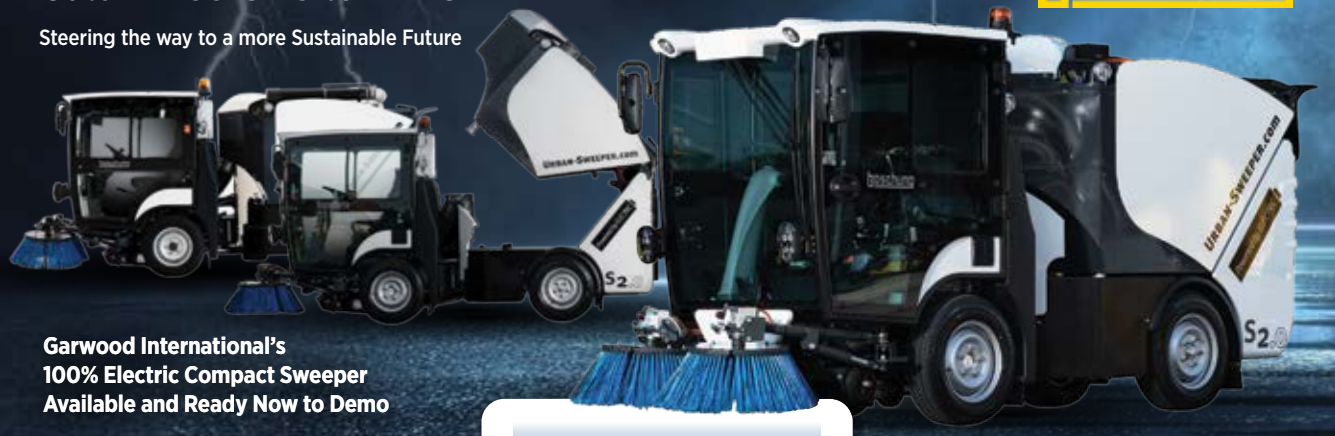
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AURRIGO AUTONOMOUS ELECTRIC SHUTTLES TO TEST DRIVERLESS PUBLIC TRANSPORT IN THREE CITIES

Aurrigo International PLC has announced its leading role in the EU-Funded Living Lab for Autonomous Electric Vehicles, in which its Auto-Shuttle vehicles will run with a safety driver on board while developing towards a goal of using remote supervisor monitoring, signalling a new era in autonomy in public transportation.

The project will be running across the European cities of Prague and Brno, as well as Milton Keynes in the UK, and is being conducted in collaboration with industry, operators, cities and University College London as the project leader.

The project is moving autonomous public transport to the next level of autonomy, by working towards removing the safety driver from the vehicle and using remote supervision. The project aims to build trust in autonomous driving, through a robust transnational safety framework, while also promoting user acceptance and trust in close collaboration with citizens, cities, operators, academia, industry, and policymakers.

By working with multiple cities in more than one country, the participants are gaining experience from different types of street layouts, road conditions and public attitudes to autonomy. This phase of the project will also examine integration with trip-planning applications used in those cities.

The European project is a milestone in

the autonomous journey of Aurrigo, as CEO David Keene explains: "Although we work all over the world, this is the first Auto-Shuttle deployment in mainland Europe for Aurrigo, and we are delighted to be working with such a prestigious group of partners to move towards this important step in autonomous public transport."

"The medieval, cobbled streets of Prague built before cars or buses were dreamt of are in stark contrast to the modern roads of Milton Keynes, which shows the importance of testing in multiple cities."

"The Aurrigo Auto-Shuttle is a perfect vehicle for this project, because we create the vehicle, software and autonomous driving hardware in-house, to work in perfect harmony, and this level of integration is vital when breaking new ground in driverless technology," Mr Keene said.

The Aurrigo technology suite on the Auto-Shuttle brings together LiDAR and cameras with its own in-house developed software to give the Auto-Shuttle a constant, 3D, all-weather picture of its surroundings to enhance safety and efficiency.



Professor of Intelligent Mobility at University College London, Bani Anvari, explains the aims of the LivingAPT project: "Cities face challenges such as reducing emissions, improving the safety and mobility of cyclists or pedestrians, increasing quality of life for citizens. Driverless shuttles or pods can be a game changer for cities as they address many of these challenges."

"However, current solutions lack a transferrable regulatory and safety framework among European cities. Low public acceptance, in combination with high investments in the new technology (incl. insurance and safety driver), are barriers to adoption for many cities," Professor Anvari said.

"LivingLAPT will deliver sustainable driverless shuttle and logistics services among various European cities by phasing out the need for safety drivers in shuttles and moving towards remote operators who overlook a number of services simultaneously. This will be achieved through a robust transnational safety framework as well as promoting user acceptance and trust in close collaboration with citizens, cities, operators, academia, industry, and policymakers," Professor Anvari added.

90 per cent of Aurigo's project costs (€274,820) come from the EU via the European Institute for Innovation and Technology (EIT), with the remaining 10 per cent coming from Aurigo (€30,506).

The Aurigo Auto-Shuttles began deployment in September.



ABOUT AURIGO

Aurigo is a leading international provider of transport technology solutions. Headquartered in Coventry, UK, it designs, engineers, manufactures and supplies autonomous vehicles and OEM products to the automotive and transport industries, particularly focusing on aviation. It is highly regarded as a specialist in autonomous and semi-autonomous technology solutions for the aviation, ground handling and cargo industries.

Aurigo has developed six types of autonomous vehicle to date, which can be utilised to reduce costs, resolve operational issues and tackle labour shortages, whilst also improving sustainability. Aurigo has three divisions, Automotive Technology, Autonomous Technology and Aviation Technology.

For more information, visit: <https://www.aurigo.com>

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Division 6 Councillor Tony Hall, Division 3 Councillor Mindy Russell and Infrastructure Chair, Councillor Teresa Lane, visit the Ray Hodgson Bridge widening site at Slacks Creek.

BREAKING GROUND ON SLACKS CREEK BRIDGE UPGRADE

The transformation of a major City of Logan thoroughfare is continuing above and below the ground.

Logan City Council has begun widening the Ray Hodgson Bridge on Loganlea Rd at Slacks Creek as part of a \$77.7 million upgrade of the stretch from Meadowbrook to the M1.

During October and November, eight 'piles' will be poured up to 7 metres into the bedrock under Slacks Creek. They will carry the weight of an additional north-bound traffic lane, footpath and bikeway.

Steel 'liners' will be driven into the ground to the full depth of the piles, before the earth is drilled out from inside each liner. The steel reinforced piles will then be poured into the excavated holes. The new 70m long bridge deck will be built over the top in mid-2024.

Infrastructure Chair, Councillor Teresa Lane, said bridge building is complex work but the disruption to traffic, residents and businesses would be minimal.

"The benefits will be huge. The city will undergo some tremendous growth in coming years, and it's crucial we have a roads network to cope, and get drivers home quicker and safer," Cr Lane said.

Division 3 Councillor Mindy Russell said the bikeway and footpath would be well used.

"This work is unlocking Logan's potential, and I'm looking forward to seeing the extra pedestrian and bike riding opportunities it will also open up," Cr Russell said.

Division 6 Councillor Tony Hall said the wider bridge over Slacks Creek would save time on residents' commutes.

"This is a vital part of the upgrade to for a safer, faster link from Meadowbrook to the M1," Cr Hall said.

Federal Minister for Infrastructure, Catherine King, said the work would have an impact on the city's residents.

"The Australian Government is proud to be jointly funding this vital bridge-widening project for Logan, delivering on our election commitments and making a real difference for the community," Minister King said.

"Projects like this ensure our road networks support residents to get home safely from each trip while keeping freight connected to our cities and regions."

The bridge is named after former Logan Mayor Ray Hodgson, who served the city from 1990 to 1991.

Council is spending \$55.2 million on the Loganlea Rd upgrade. The project is receiving \$22.5 million in funding from the Australian Government's Infrastructure Investment Program.

RECYCLED PLASTIC PIPES ON SUNBURY ROAD UPGRADE

The Sunbury Road Upgrade to the north-west of Melbourne is setting an example for sustainability across major transport infrastructure projects, by installing industry-leading, environmentally friendly recycled pipes.

As part of the upgrade, crews installed 550 pipes and 3.3 kilometres of recycled pipes to improve stormwater drainage on the northern side of the new Jacksons Creek bridge and along the Sunbury Road Upgrade Project. These colourful, speckled pipes are 100 percent recycled high-density polyethylene, made up of a wide array of household plastic materials, including milk bottles, shampoo bottles and kitchen and laundry product packaging.

Up to 5000 milk bottles are recycled to produce one 630mm RPM pipe. That's equivalent to more than 1.3 kilometres of waste milk bottles laid end to end. More than 2.75 million recycled plastic bottles were used in addition to other recyclable materials to create the pipes along this project.

Approximately 80.5 tonnes of recycled plastic was used to build the pipes.

Speaking about the use of the recycled pipes, Major Road Projects Victoria Program Director, Dipal Sorathia, commented: "We are proud to deliver on Victoria's Recycled First policy and employ more sustainable construction practices on the Sunbury Road Upgrade, because it provides the best environmental outcomes."

The high-quality pipes are manufactured locally in Kyabram by RPM.

The innovative piping will deliver benefits for both the environment and local community. They are lighter than traditional concrete pipes, making them safer and quicker to install.

MRPV and its construction partners, supported by ecologiQ, are committed to identifying ways to use more recycled materials across all major road upgrades, in line with the Victorian Government's Recycled First Policy.

The shift to recycled products is being driven by

Victoria's ecologiQ program, which is leveraging Victoria's Big Build to boost the use of recycled and reused materials. Recycled First is being implemented across future Victorian Big Build projects as well as Department of Transport and Planning projects from 2022.

The Sunbury Road Upgrade will be completed by 2025.



NEW LEASE ON LIFE FOR OLD MURRAY BRIDGE

Major refurbishment works to safeguard the future of the South Australian State Heritage-listed Old Murray Bridge are nearing completion, with two-way traffic being reinstated on the bridge earlier than anticipated. Two-way traffic was in place on the bridge as of the end of September – about three months earlier than expected.

Old Murray Bridge is a significant State Heritage structure. It was constructed over the River Murray in 1879, the first major bridge spanning the river in South Australia.

Due to its age, cultural importance and critical location in the road network, it was vital to maintain its long-term structural integrity. This refurbishment project improved the heritage value of the bridge and has extended its operational life by up to 30 years.

The project has also improved pedestrian access across the bridge, and safety for all road users. The works have included:

- repainting the bridge to ensure long-term corrosion protection of the steelwork and also improve the heritage amenity of the bridge;

- repointing, cleaning, and general repairs to the stonework and rebuilding the northern parapets to their original height;
- upgrading the bridge lighting to LED lights to improve visibility and enhance road safety at night;
- installing corrosion protection to prevent degradation of the iron on the river piers;
- reconstruction of Pier 26 in order to maintain the structural integrity of the bridge;
- upgrading pedestrian approach fences to better integrate with the existing heritage fencing;
- upgrading footpaths and drainage at the southern approach to improve pedestrian access, safety and improve amenity in the area; and
- installing interpretive signage to recognise the Aboriginal and non-Aboriginal history of the area.

The reinstatement of two-way traffic on the bridge also marks the end of traffic restrictions, temporary closures and diversions associated with the refurbishment. Minor finishing works, mainly underneath the bridge, are expected to be completed in early 2024, weather permitting.



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TAMING TASMANIA'S HEART: THE GREATER MEANDER IRRIGATION SCHEME

Nestled in the heart of Tasmania, where rolling hills meet pristine waters, lies a tale of transformation, resilience, and the unyielding spirit of human endeavour. The Greater Meander Irrigation Scheme, a marvel of engineering and innovation, has breathed life into this serene landscape, turning it into an agricultural paradise that is the envy of the island.

Throughout the winter season, water is collected within the confines of the Meander Dam. Subsequently, this stored water is distributed over a span of 150 days during the summer months. This distribution occurs through controlled releases into the Meander River and a network of pipelines that run alongside the river, effectively nourishing the district.

REPLACING DETERIORATING INLET STRUCTURES

Pump station inlet structures assume a pivotal role in the allocation and control of water distribution to agricultural fields. However, blockages and silt accumulation can compromise their effectiveness and capacity.

The vulnerability of the inlet structures to the Meander Dam is no exception. In order to ensure uninterrupted service to local clients, and circumvent the need for costly and intricate ongoing maintenance, Tasmanian Irrigation set about replacing the most adversely impacted units.



CUTTING-EDGE AND LONG-LASTING PRECAST INNOVATION

In a collaborative effort with designers, sub-contractors and installation contractors, National Precast Master Precaster Hudson Civil devised a custom precast solution tailored to not only meet the client's demands but also ensure long-lasting performance.

Jason Lanham, Hudson Civil's General Manager, says the company's technical experts dedicated extensive effort early on in the project, collaborating closely with Tasmanian irrigation designers and the contractor Sub-41. Together, they meticulously crafted a more resilient solution that would not only enhance intake capacity but would also ease maintenance and ensure resilience in the face of recurrent river system floods.

FACTORY-CRAFTED FOR SUPERIOR QUALITY, ENHANCED SAFETY AND STREAMLINED INSTALLATION

The solution integrated the precaster's distinctive unicultvert system, produced using specialised moulds that enable precise tolerances and ensure exceptional quality. Meanwhile, installation of the structural steel and aluminium components was strategically divided between the factory and on-site.

In the factory, steel elements, including the sub-frame, were meticulously fabricated and subjected to precise testing. This approach - simplifying the foundation and placement procedures - yielded a secure, precise, and efficient installation process... an achievement that would have been unattainable with cast in-situ products.



UNICULVERTS PAVE THE PATH TO THE FUTURE

This project exemplifies the Tasmanian civil construction industry's commitment to leveraging innovation and the latest advancements in precast technology to attain favourable project results.

The versatility and transformative capabilities of the unicultvert system are evident to such an extent that Tasmanian Irrigation has embraced this system for all their intake structure replacements and new installations.

This ongoing partnership with Hudson Civil underscores their joint commitment to executing capital works programs effectively and safely.



Project: Greater Meander Irrigation Scheme

Client: Tasmanian Irrigation

Master Precaster: Hudson Civil

TWO DAYS OF PRECAST BUSINESS & FUN

Anyone involved in precast specification, design, manufacture or construction is welcome to participate in the National Conference that is being run by the precast industry's peak body, National Precast, later this year.

The Conference runs over three days and is being held at the Crown Plaza in the beautiful Sydney beachside location of Coogee from Monday, 30th October to Wednesday, 1st November 2023.

National Precast's CEO Sarah Bachmann says that this conference will be bigger and better.

"With support from our Conference Partner Leviat, we will be bringing together leaders in the precast industry from around the country, providing a wonderful opportunity to catch up with friends old and new," Bachmann comments.

The October Conference sees the introduction of the Welcome Reception and Exhibition, showcasing new products from over 15 suppliers.

"The Welcome Reception and Exhibition will be Hawaiian-themed. There'll be plenty of time to see what's new, chat and enjoy the special entertainment we have planned."

The line-up of speakers for the full-day Conference is impressive, with some of the presentation topics including tough contracting (with success), meeting supply challenges in big projects, creating healthy working environments and overcoming the new multi-employer bargaining provisions of the Fair Work Act.

The Conference Day will be followed by an underwater-themed Networking Dinner overlooking the water at Coogee's Ocean

Room, with entertainment and prizes! And on the final day, for members, there'll be a visit to the Metro West tunnel segment factory.

"We're taking steps to ultimately create an event that is widely talked about and that draws anyone who manufactures, supplies, specifies or uses precast," says Bachmann.

"We want to make doing business, fun. Come along and see what our exhibitors have to offer, share information and learn."

Register at www.nationalprecast.com.au/events, or contact Shiva on 0451 475 724. Tickets are limited, so make sure you get in FAST!



National Conference Sydney

Monday 30th October 2023

Board Meeting (Board Members only)

Board & Industry Partners Lunch (Board & Industry Partners only)

Welcome Reception & Exhibition (Sponsored by Reid Construction Systems)

Tuesday 31st October 2023

Conference

Networking Dinner (Sponsored by PSA & Progress Group)

Wednesday 1st November 2023

Factory Visit (Members only)

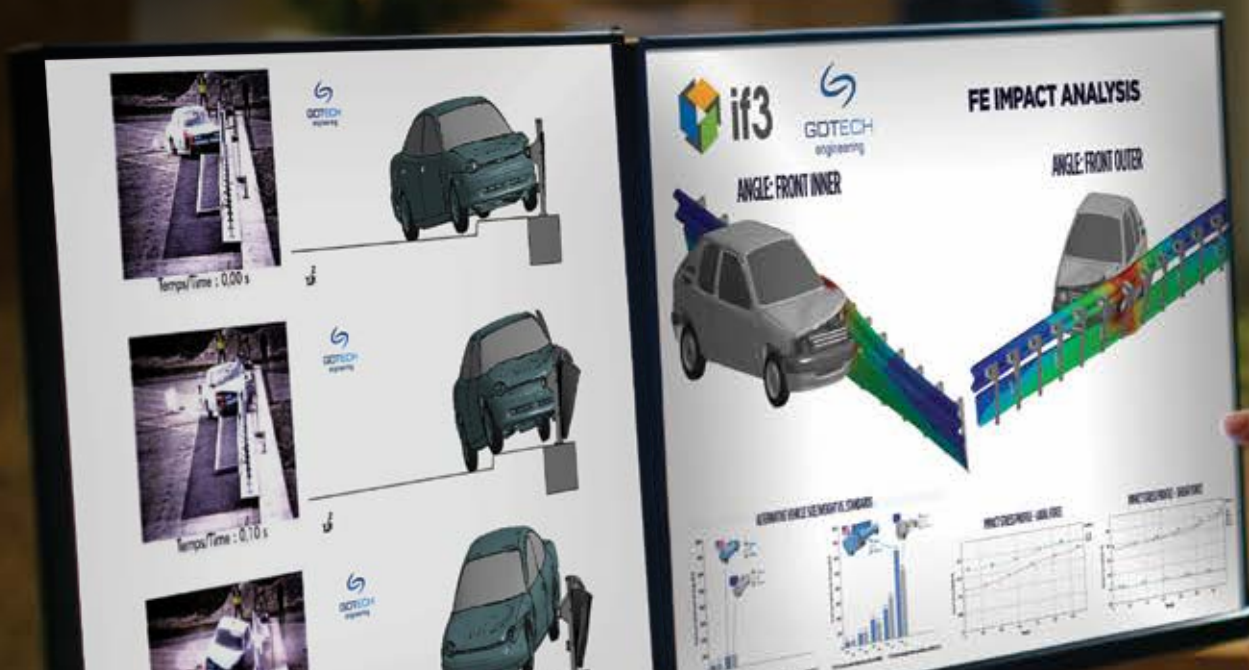
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Each hyperTunnel hyperBot works to a construction plan, which determines exact deployment location, material strength, chemistry specification (different robots can carry different chemicals) and chemical volume.

IS A NEW APPROACH TO UNDERGROUND CONSTRUCTION ABOUT TO TRANSFORM THE ENGINEERING LANDSCAPE?

PATRICK LANE-NOTT, DIRECTOR OF ENGINEERING, HYPERTUNNEL

As countries and regions face their own unique developmental challenges, the need for innovative construction methods is intensifying. The infrastructure in and around cities, for example, including transportation links to better connect rural communities, is key to driving socioeconomic progress that does not drive an inequality wedge between groups of people.

Inevitably, this demands a conveyor belt of construction comprising all manner of structures and buildings, from residential accommodation and healthcare facilities to

the roads and railway lines required to expand multimodal and far-reaching transportation networks. However, many developed cities and urban conurbations are struggling to find the space needed to accommodate these additional building requirements. While taller and taller buildings have become a common feature of skylines, there is only a finite amount of land that can be developed.

One means of addressing this challenge is to look downwards and build underground.

In addition to solving inner-city building challenges, key industrial sectors, especially

the likes of underground mining and utilities, already rely heavily on sophisticated networks of tunnels, arches and subterranean structures to operate.

It is big business. For instance, as a subsegment of the underground construction industry, tunnelling alone is set to expand markedly over the course of the current decade. In 2021, the sector was worth \$105 billion worldwide – by 2027, it will have expanded by more than 50% to almost \$261 billion. (Source: ITA - International Tunnelling Association - 2019 Tunnel Market Survey)

HYPERTUNNEL: A FRESH APPROACH

Crucially, there are some major advances in technology on the horizon that promise to make underground construction and maintenance significantly faster, cheaper, safer, less disruptive and more environmentally friendly.

Approaches to processes such as tunnelling have broadly remained the same for well over a century, meaning projects continue to be characterised by high levels of risk, complexity and cost, as well as a heavy carbon footprint.

However, hyperTunnel presents a new method of underground construction that is gaining traction – one that leverages the power of swarm robotics and in-situ construction to transform the traditional tunnel boring process.

HOW DOES IT WORK?

The first step is to drill and line pilot bores and send robots inside to inspect the geology, taking core samples and scanning using ground penetrating radar. The result? A near-perfect understanding of the entire tunnel length's geology. Using this data, we develop a virtual model of the tunnel structure – the digital twin. Leveraging AI and machine learning, the next step is to design the optimum solution to create a sound structure.

Once the structure profile is defined, a swarm of robots is sent into the lined bores to visit planned locations to drill and deploy chemistry according to the AI-generated design. Thousands of robots could be used, all controlled using swarm technology to 3D print the structure, much like how bees build a hive or

Swarms of hyperBots are sent into each construction bore to build the structural shell, deploying an additive manufacturing process, similar to 3D printing

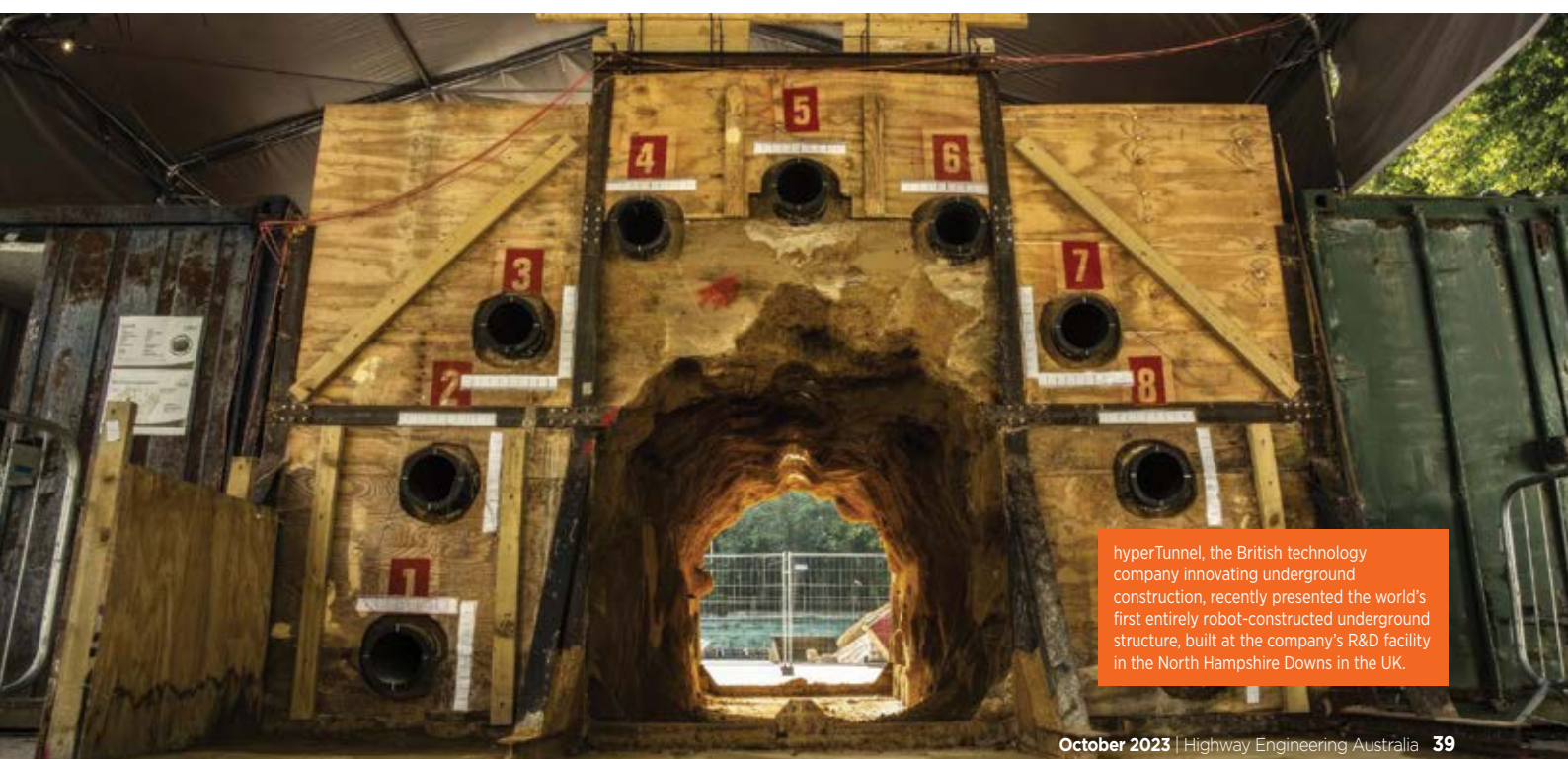


termites build a mound. After precise chambers are carved into the geology, these are filled with suitable construction material, creating in-situ blocks that interlock to form a permanent structure.

The survey bots are deployed again to ensure the construction material is located correctly and matches the digital twin. Finally, the tunnel walls are prepared for their end use, leaving a smart structure that can be monitored and

maintained throughout its life.

As well as creating structures from scratch, the hyperTunnel method can be used for the monitoring, repair and maintenance of underground structures. In the area of water management, for example, it has the potential to deal with issues of water ingress in tunnels, bridges, culverts and other structures by managing the water flow coming into the tunnel.



hyperTunnel, the British technology company innovating underground construction, recently presented the world's first entirely robot-constructed underground structure, built at the company's R&D facility in the North Hampshire Downs in the UK.

TESTING IN THE REAL WORLD

So, how close are we to seeing hyperTunnel robots in the ground?

The truth is we already are. Last year, the world's first entirely robot-constructed underground structure was unveiled at hyperTunnel's R&D facility in the UK. This is part of a project with Network Rail, the body responsible for maintaining UK rail infrastructure. The organisation is eager to adopt technologies that enable low-disruption tunnel maintenance and, a contract has been secured to manage the waterflow in a leaking tunnel.

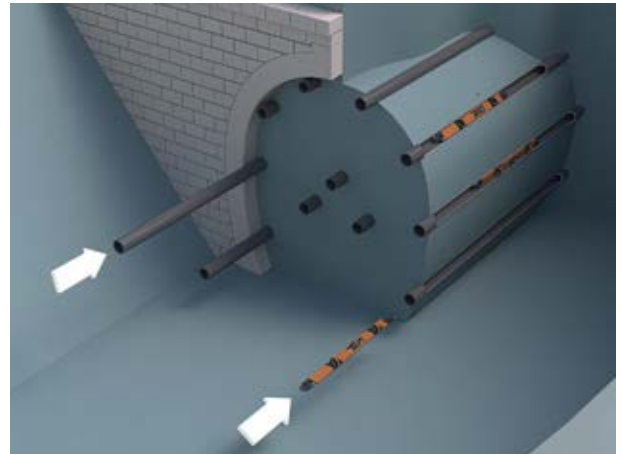
In addition, hyperTunnel has also submitted a feasibility study into the potential to build an underpass at the Global Centre of Rail Excellence (GCRE) in Wales, UK.

The testing landscape for this novel application involves swarm simulation, robot development, fleet planning and building, regulatory compliance and process engineering to meet various development milestones.

Constant testing is taking place at hyperTunnel's own indoor test centre. There, robots are run on a 24/7 basis through 12-metre pipe sections, which replicate the section size and operating space of the actual underground construction environment.

hyperTunnel is using AI to verify and validate its robots and end-to-end production system, with AI algorithms learning the best course of action for any failures. An example of this learning would be where the system automatically classifies and characterises the geology and then selects the correct treatments.

hyperTunnel has built a swarm simulation that can calculate contract timings and fleet performance by using AI to select the optimum fleet and robot parameters. The beauty of swarm robotics is that it has built-in resiliency, the AI being able to shrink or grow the fleet automatically to ensure that the contract is delivered on time.



Rather than digging through the ground with a cylindrical boring machine or using a traditional drill-and-blast technique, the hyperTunnel method uses a simple horizontal directional drilling (HDD) rig to install a network of HDPE pipes to provide access to the whole tunnel length so that a swarm of multi-function robots can 3D print the tunnel.

CUSTOMER FOCUS

It's been important to the test strategy to enlist a diverse set of team members who reflect the typical technical competency of construction industry asset managers who will manage a hyperTunnel system over the life of the underground structure.

If hyperTunnel is to successfully disrupt the status quo in underground construction, in addition to being more efficient, sustainable and cost-friendly, it must also be as user-friendly as possible.

For more information, visit: <https://www.hypertunnel.co.uk>

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