

CORE2018

CONFERENCE ON RAILWAY EXCELLENCE

Rail: smart, automated, sustainable

RTSA

30 APRIL-2 MAY || SYDNEY AUSTRALIA

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REGISTRATION
BROCHURE

INVITATION TO ATTEND



Colleagues, on behalf of the Organising Committee, I extend a warm invitation to you and your associates to participate in the Conference on Railway Excellence, CORE 2018, in Sydney next May.

CORE is the leading Australasian rail conference showcasing technical excellence and the latest developments in the industry. The 2018 conference theme is: *Rail: smart, automated, sustainable*. Technology is constantly evolving and this has presented both solutions and challenges in the way we plan and deliver rail services and infrastructure.

The conference will provide a knowledge exchange platform between emerging technologies and our existing infrastructure and projects, maximising the efficiency and benefits for the end customer and industry. It will broadly cover all disciplines of railway from fundamental research to “blue sky” applications, highlight global scientific interactions and collaborations, and feature the unique location, culture and beautiful geography of Sydney.

We expect to attract 700 attendees focused on rail transport issues representing all rail related disciplines from engineering research and practice, private industry, and governments. CORE 2018 will include a full technical program of plenary, oral, post-conference short courses and field trips. We especially welcome young professionals, researchers, and students and will have dedicated events for them – the Future Generation.

We are proud to announce that our sister Systems Engineering Society of Australia (SESA), a Technical Society of Engineers Australia and the Australian Chapter of the International Council On Systems Engineering (INCOSE), will also hold their SETE 2018 conference alongside CORE 2018. A joint plenary session and technical stream will be held on Day 2 of the Conference, as well as other networking opportunities during the day to share knowledge, ideas and to network including the WSP Gala Dinner.

Our keynote and invited speakers come from around the world, representing the very best in their field, with extensive backgrounds in advancement of sustainability of rail and intermodal trade as well as urban planning. There will be around 90 selected high-quality peer-reviewed papers in the technical sessions. The program structure of previous years has been maintained given the expectations of delegates,

however the CORE2018 Committee has slightly departed from the traditional

discipline based streaming, in order to encourage papers in business focus areas that are emerging in many railways, particularly in assurance and customer facing systems. A centrepiece of the exhibition will be the “Knowledge Zone”, the home of the ACRI Rail KnowledgeBank. This will provide delegates the opportunity to search world wide databases and libraries that cover railway engineering and operations.

CORE 2018 will be held at the newly completed International Convention Centre (ICC) in Sydney, a world class facility. As well as the keynote speakers and presentations of papers, the program will include an industry exhibition, the Gala dinner sponsored by WSP and networking opportunities. The ICC is located in the heart of Sydney, with stunning views over Darling Harbour and within close proximity to transport, accommodation and dining options to enhance your CORE 2018 experience.

The success of a conference like CORE is thanks to many people and organisations, particularly our generous host sponsor Transport for NSW and our Platinum sponsors ARTC and Aurizon.

The conference sessions, networking events, and technical tours will provide outstanding opportunities for the exchange of new ideas and developments, and for the sharing of experiences and information. Sydney offers so much to see and do, we welcome you to come and share what is on offer.

We look forward to welcoming you to Sydney, for CORE 2018

Yours sincerely
Katharina Gerstmann
Conference Chair CORE2018

Organising Committee

Katharina Gerstmann
Conference Chair
CORE2018

John Paff
Industry Liaison

David Caldwell
Deputy Conference Chair

John Watsford
Technical Committee Chair

Bill Laidlaw
Technical Tours

Stephen Muscat
Social Events Program

Roger Buckley
Committee Member
Aurizon Representative

Mark Carling
Youth Scholarship Award
SNC-Lavalin
Representative

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Venue

International Convention Centre (ICC)
14 Darling Drive,
Sydney, NSW
T: +61 (0) 2 9215 7100
W: www.iccsydney.com.au

Featuring a striking contemporary design, leading technology and multipurpose spaces, ICC Sydney is a beacon of innovation, learning and entertainment, connecting and celebrating leaders of invention, business, governance and the arts.

The ICC Sydney sits in the heart of Sydney in a prime waterfront location in Darling Harbour.



Key Dates

Early Bird Registration closing date: Monday 30 January 2018

SNC-Lavalin Rail Youth Scholarship application closing date: Monday 15 February 2018

Conference 30 April-02 May 2018

Sponsorship & Exhibition Opportunities still available

For further information contact:

Anthony Bordignon,
CORE 2018 Conference Manager
T: +61 (7) 3226 3026
E: core2018@engineersaustralia.org.au

Website: www.core2018.org

The Conference on Railway Excellence (CORE) is hosted by the Railway Technical Society of Australasia. The Railway Technical Society of Australasia (RTSA) is a joint Technical Society of Engineers Australia and Engineering New Zealand, formed to further the interests of the railway industry at large and its individual participants.

RTSA is a non-profit organisation and was established in 1997 for the purpose of promoting the co-operation of academic, industrial, commercial and governmental organizations in relation to the practice and advancement of railway technology and management in Australasia.

The activities of the RTSA are directed towards providing leadership for the facilitation and coordination of professionalism in the railway industry and the encouragement of member contributions to the application of railway technology and good management practices. The objectives of the RTSA are, to stimulate the active contribution and participation of its members in the development and dissemination of railway technology and management knowledge, so to support the business of the railway industry, to provide for the continuing professional development of its members and to promote close working relationships amongst participants in the railway industry.

RTSA provides an exciting and convenient portal to the technical world of railways. It provides opportunities to learn and network with peers and also the opportunity to attend conferences and site events.

RTSA is now linked in to specialist railway libraries and the network provides the opportunity to share and disseminate knowledge.

Now that RTSA has its own newsletter embedded in Australasia's foremost Track & Signal magazine, all our members can enjoy the full Track & Signal experience including leading articles from industry leaders.

RTSA's activities strongly encourage learning and excellence in practice so we provide a large number of awards and scholarships annually. We reach into our potential membership by conducting sessions where we put University Students and Industry Representatives into a congenial atmosphere. The students are able to ask all those questions they have been afraid to ask and get answers from real practitioners.

On learning, RTSA has over 60 sessions around Australasia every year where members and guests can listen to emerging and exciting technical innovation. We also conduct field visits, called STORE, where we investigate, on the ground, what is happening in a part of the industry. Recent STORE's include Light Rail and Regional Rail and Heavy Haul.

There's plenty of things to do and discuss with like-minded colleagues in an industry that is rolling out the latest technology.

Currently there are six Chapters across Australia and New Zealand established under the RTSA umbrella. All chapters run programs that not only address topical railway issues but provide the opportunity for joint meetings with other similar groups in the industry.

Special Offer

Become a member as part of your CORE 2018 registration and you can take advantage of the membership registration rates.

Individual Membership is only:

- \$88 Australian resident
- \$69 New Zealand resident
- \$64 Overseas resident
- FREE Student and Retired

Membership

Membership in RTSA is available in two grades:

- Individual and Corporate.

Membership benefits include:

- Significant discount on conference delegate fees
- Subscription to Track & Signal Magazine
- Participation in local chapter meetings and programs

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SNC LAVALIN

PROFESSIONAL SCHOLARSHIP



SNC-Lavalin are the proud sponsors of the Young Professional Scholarship. Up to 50 scholarships will be awarded to young professionals working towards or already employed in the railway sector, including tertiary students or recent graduates (with less than 3 years full time employment) to attend CORE 2018

CORE 2018 includes:

- Information on cutting edge rail technology
- Diverse program of high quality technical papers including Rolling Stock, Signalling, Communications and Electrical Engineering, Safety and Risk, Systems and Management and Wheel Rail Interface
- Professional Development attendance certificate for your CV
- Networking opportunities

Nominations are now open for those with an interest in the rail industry from:

- Engineering
- Project Management and Planning
- Operations and Maintenance
- Safety
- Business and Commerce
- IT
- Spatial Sciences

Successful Applicants Receive:

CORE 2018 Conference registration including:

- Access to conference sessions
- Icebreaker with fellow award recipients, RTSA Executive and sponsors prior to Welcome Reception (Monday 30 April)
- Ticket to Welcome Reception (Monday 30 April)
- Delegate registration pack including program handbook, delegate bag, name badge and conference proceedings

Top Tier Awardees – Only 3 Awards: (judged based on the quality of the Main Application)

In addition to the above:

- Ticket to the WSP Gala Dinner
- RTSA Membership paid for you for a year
- Give a 5 minute presentation at a special plenary session during CORE 2018 (based on the content of your Main Application). You will actually be in the CORE 2018 program!
- The Main Applications of the three Top Tier Awardees will be edited and published in Track & Signal Magazine

Emerging Young Professional Award: (selected from the Top Tier Awards)

The Top Tier Awardees' presentations will be voted for by delegates via the Conference App and judged as the Emerging Young Professional of CORE 2018, and will receive:

- Recognition and acknowledgement as the CORE 2018 Emerging Young Professional and award
- Registration fee paid for CORE 2020 – you essentially receive a double scholarship!
- At CORE 2020 (if you can attend) you will be required to make a presentation to the Youth Scholarship Attendees of 2020, and present the award for the Emerging Young Professional of CORE 2020

Successful applicants will be required to fund their own travel and accommodation to attend the Conference.

Nomination Process

Nominees will be required to submit the following information at time of nomination via the CORE 2018 website www.core2018.org

Brief Background

Education Details

(max 150 words)

- Relevant Degree(s)/Qualification(s)
- University or other Institution where you will receive/received your degree/qualification
- Year completed Degree/Qualification or will complete

Work Experience (max 150 words)

Your most recent work experience (professional or student) position, organisation, period, and a brief overview of role.

What are your main reasons for wanting to attend CORE 2018?

(max 150 words)

Main Application

Choose any area of the rail industry, and identify an aspect that you believe could be improved or refined. It can be any area of your choosing: e.g. project management and planning, operations and maintenance, business, etc. Your idea does not need to be deeply technical – it is simply your opportunity to demonstrate your engineering or business and commerce ideas.

In 500 words or less:

- Describe your idea;
- How it could go towards improving an area in the rail industry; and
- Any possible implementation challenges.

For further information on the SNC-Lavalin Young Professional Scholarship, please contact the CORE 2018 Conference Secretariat on +61 (0) 7 3226 3026 or email: core2018@engineersaustralia.org.au

Nominations Now Open at
www.core2018.org

Closing Date:
Monday 15 February 2018

KEYNOTE SPEAKERS



Leslie Woo

*Chief Planning Officer
Metrolinx Canada*

Leslie Woo is at Metrolinx, the regional transportation authority for the Greater Toronto and Hamilton Area and the 2015 Outstanding Leader by Canada's Women's Infrastructure Network

Leslie leads the strategic planning for Metrolinx, including transportation and service planning. A key partner with the Chief Capital Officer in the delivery of the \$35B capital rapid transit expansion underway, she establishes the pipeline of future projects and establishes project scope and business case. Other strategic files led by Leslie include: fare integration, sustainability, design excellence and universal access. Leslie is frequently the public face of Metrolinx and a member of the executive management team. She heads key external relationships with municipalities, not-for-profits and the private sector.

Prior to joining Metrolinx Leslie worked in the public, private and not-for-profit sectors. She was the key author of the original Greater Golden Horseshoe Growth Plan (2006), which by 2016 had resulted in urban intensification totalling over 18 per cent increase in multi-family residential development, a two-thirds reduction of greenfield lands consumption, and conserved about 800 square kilometres of agricultural and rural land.

Amongst her many global professional accomplishments, Leslie is a 2011/12 Fellow and member of the International Women's Forum, a Global Trustee with the Urban Land Institute, and a retired member of the Ontario Association of Architects. Leslie holds many community volunteer roles including Board Director with the Womens' College Hospital and YMCA for the Greater Toronto Area.

Leslie received a Bachelor of Environmental Studies and a Bachelor of Architecture from the University of Waterloo where she also studied Urban and Regional Planning. She is also the 2015 recipient of the Renison University College Distinguished Alumna Award. Born in Trinidad, Leslie is the mother of two young adult global citizens.



Jean- Pierre Loubinoux

*Director General
International Union of Railways*

A graduate of the Ecole Centrale Paris, he worked at the French Foreign Trade Delegation to Hong Kong (1977-1978) before joining French railways SNCF in 1978, where he held various responsibilities including Director of the SNCF General Delegation in North-America and Chief Executive of French Railways UK Ltd in Britain. He then joined the SNCF Freight Department where he successively managed the Coal-Steel Business Unit and the Human Resources, Data Processing and Finance Department before being appointed Chief Executive of SNCF Freight International (2001) and from 2001 to 2009 Chairman and CEO of SNCF International and SNCF Director of International Development.

In March 2009, Jean-Pierre Loubinoux was appointed Director-General of the International Union of Railways (UIC), the worldwide association representing the rail sector and encompassing 210 railways, from 100 countries, across all the continents. His mandate is set to run until 2019.

In addition, Jean-Pierre Loubinoux holds responsibilities in a large number of institutions and associations: French Foreign Trade Advisor and Chairman of the Transport Committee, Chairman of the Medef International France-Argentina-Uruguay Committee, Vice-Chairman of the Ecole Centrale Association, Honorary Chairman of AFFI (the French association of railway engineers and managers), Member of the Chartered Institute of Transport, Member of the Board of the US High Speed Rail Association., and the Mineta Transport Institute.

He has also been selected to be advisor to UN Secretary General, in a High level group for sustainable mobility, and member of the board of Slocat.

Jean-Pierre Loubinoux has been awarded the Legion of Honor and is a holder of the Silver Medal of the French Ministry of Equipment, Transport and Tourism.

In September 2011, Jean-Pierre Loubinoux received his insignia as Commander of the French National Order of Merit – one of the highest decorations in France along with the Legion of Honor.

He also edits books of poetry, and creates paintings.

MASTER OF CEREMONIES



Sally Dominguez

Sally Dominguez is an Innovation Catalyst and a Frugal Innovator. She has won 7 international industry awards for product design and sustainability and was named one of Advance’s “50 for the Future” entrepreneurs working in the USA in 2012. Sally was a judge on ABC TV’s New Inventors for six years and currently judge’s product design in the USA and China, and Car of the Year in Australia.

All of this work informs her passion, which is ensuring that all people realize their potential to be agile thinkers and consistent innovators.

Sally’s zest for life is reflected in her diverse experiences that include judging cars and rallying, working with NASA, driving a fuel cell prototype across China and independently realizing her sustainable products into multiple markets. Sally’s work ranges through manufacturing, the auto industry, building, design and television, making her an unusual and inspiring alternative role model to anybody who has been told they need to specialize and/or have a singular passion. Sally’s work exemplifies frugal innovation, and she was part of the 2016 SouthBySouthWest Frugal Innovation panel.

Sally’s innovative design work has been celebrated in numerous publications, including Design Australia’s 100 Years of Australian Innovation, Secrets of Top Designers, Cool Green Hunting and Design Like You Give A Damn. Her design work is held in Sydney’s Powerhouse Museum and has been shown at the V&A in London and Museum of NYC.

Sally has pioneered the use of her ADVENTUROUS THINKING strategy in NSW schools as well as businesses in Australia, the USA and China. ADVENTUROUS THINKING uses Five Lenses to help users think outside their “expert” default neural pathways. ADVENTUROUS THINKING fosters a consistently innovative mindset through teaching a healthy disregard for small daily failure. In 2017 Sally will present ADVENTUROUS THINKING workshops at VIVID Sydney including the first VIVID Idea events specifically designed to promote innovative thinking and idea sharing with teenagers.



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PROVISIONAL PROGRAM

*This provisional program is subject to change

Monday 30 April 2018					
1400-1930	Registration open				Foyer – Level 2
0900 -1700	Pre-conference site tours – Multiple tours – half day options				Various locations
1630 -1730	Young Professional Scholarship Icebreaker networking function				The Gallery
1730 -1930	CORE 2018 Welcome function				The Gallery
Tuesday 01 May 2018					
0700 -1900	Registrations Open				Foyer – Level 2
0730 -0815	Conference Presenter & Session Chair – Meet-up				Foyer – Level 2
0730 -1900	Exhibition open				The Gallery
0830 -1025	Opening Plenary Session				Pyrmont Theatre
0830-0840	CORE 2018 – Welcome - Sally Dominguez, Master of Ceremonies				
0840-0845	Traditional Land Owners welcome – Uncle Alan Madden				
0845-0855	RTSA Welcome – Philip Campbell OAM, Executive Chair, Railway Technical Society of Australasia				
0855-0915	Official opening – Minister for Transport, NSW, TBC				
0915-1015	Keynote Speaker 1 – Leslie Woo, Chief Planning Officer, Planning and Policy, Metrolinx, Canada				
1015-1020	RTSA Annual Rail scholarship announcement				
1025-1055	MORNING TEA The Gallery				
Theme	Project Management Assurance Session 1 a	Infrastructure Advances Session 1 b	Rollingstock Automation Session 1 c	Signals/Level Crossings Session 1 d	Track Maintenance Advances Session 1 e
	Session Chair: Simon Wood	Session Chair: Max Michell	Session Chair: David Jehan	Session Chair: Georgina Hartwell	Session Chair: John Paff
1055-1120	Developing a Variable Model of Assurance for the Rail Industry David Roberts Tactix Group	Railway Overbuilds – The New York Experience Sean O’Gorman WSP AUSTRALIA	Introducing Sydney’s fully-automated metro rolling stock David Venn-Brown Northwest Rapid Transit	The Evolution of Level Crossing Control Systems Stewart Rendell John Holland Rail	Aluminothermic Welding: The Current State of Practice, Performance and Development a Century on Dr Iman Salehi Institute of Railway Technology Monash University
1125-1150	TBA	The need for significantly improved accuracy in forecasting rail project time and cost outcomes Colin Cropley Risk Integration Management	Continuous Measurement of Passenger Ride Comfort and Track Condition on the V/Line Network Glenn Hardie Institute of Railway Technology Monash University	Safety in Design - A Practical Approach for Signalling Trevor Moore Australian Rail Track Corporation	Advancement in Track Technology - Composite Foundations for Increased Speed and Axle Loads Distinguished Professor Buhhima Indraratna University of Wollongong
1155-1220	Assuring the Rail Service Lifecycle, putting the timetable at the centre of a safe railway Andrew Petrie Transport For NSW	A Data Driven Design Workflow – Case Study: Caulfield to Dandenong Alliance Mark Roberts Aurecon	Transport for NSW – procuring a Regional Fleet to deliver sustainability Guy Collishaw Transport For NSW	ATC Pre – An Innovative Signalling System Preparing for Automatic Train Control Kelvin Liu Public Transport Authority of Western Australia	Development of a non-contact laser speckle imaging system for strain and stress measurements in rails Dr Siva Naidoo Institute of Railway Technology Monash University
1220-1310	LUNCH The Gallery				

PROVISIONAL PROGRAM

	Project Management Assurance Session 2 a Session Chair: David Bainbridge	Infrastructure Advances Session 2 b Session Chair: Graham Tew	Rollingstock General Session 2 c Session Chair: Kin Wong	Signals Automation Session 2 d Session Chair: Kaniyur Sundareswaren	Track Maintenance Advances Session 2 e Session Chair: David Cooper
1310-1335	Managing the Mock Up David Jehan RTSA	The dynamic digital jigsaw Will Hackney Aurecon	Converging Parallels: How Autonomous Vehicles and Driverless Trains Influence Each Other Michael Crocker & Rodrigo Alvarez Public Transport Authority of Western Australia	Improving safety and the passenger experience in and around rail infrastructure using communications technology Dr Paul Reichl Institute of Railway Technology Monash University	Reducing wheel-rail noise on the JVL line - Using data analysis to identify influencing factors Rhys Hayward Greater Wellington Regional Council
1340-1405	What risk matrix and risk acceptance level should be used in a GoA4 UTO Application? Dr Gary Bundell AECOM	Efficient and Sustainable Railway Construction through Modern Construction Materials and Technologies John Hammond Elasto Plastic Concrete	Prediction of Railway Vehicles' dynamic behaviour with machine learning algorithms Dr Nithurshan Nadarajah Institute of Railway Technology Monash University	Separating Automatic Train Protection Systems from Below Rail Infrastructure Graham Hjort & Tony Crosby 4Tel	Prediction of rolling contact fatigue damage associated with rail welds Dr Jerome Pun & Darrien Welsby Institute of Railway Technology Monash University
1410-1435	Effective Assurance of Rail Projects without Using the Word Assurance Dr Katherine Eastaughffe Acmena Group	Digital starting blocks: The Sydney metro experience Samantha McWilliam WSP AUSTRALIA	Meeting the Future Needs of Rail Passengers Matthew Dudgeon & Doug Pickering ARUP	Mind the Gap – How looking beyond the system boundary benefits everyone Paul Barnsley ALIRE Consultants NZ	Rail milling as an integrated strategy for modern rail asset management Dr Richard Stock Linmag GmbH
1440-1505	Systems Engineering and Systems Assurance for Complex Rail Projects Dr Quoc Do Frazer Nash Consultancy	Challenges to Achieving Functional Safety Compliance of Railway Tunnel Automated Systems Matthew Sorrensen AMOG	Smarter railways of the future – the opportunities of big data Barry Moore Aurecon	Railway Engineering – How to Monitor Integration of Multiple Systems? Sunny Chan Nrt	TBA
1505-1535	AFTERNOON TEA The Gallery				
	Project Management Assurance/ Automation Session 3 a Session Chair: David Orr	Infrastructure General Session 3 b Session Chair: Katharina Gerstmann	Rollingstock Sustainability Session 3 c Session Chair: Roger Buckley	Infrastructure Track Design Session 3 d Session Chair: Richard Hitch	Track Maintenance Advances Session 3 e Session Chair: Colin Cole
1535-1600	TBA	Instant Dynamic Rail Track Scale System under the loading chute John Lee Resources Optimisation	Extending the Life of Legacy Urban Passenger Trains: A Physical Network Approach Dr Amir Shamdani Institute of Railway Technology Monash University	Advancements in noise and vibration assessments for elevated rail designs Arvind Deivasigamani WSP AUSTRALIA	Using big data to slash rail wear and energy consumption through cant optimisation Daniel Buntine Aurizon

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1605-1630	Requirements management, business rules and automation Rudi Rolih Nrt	Computational methods for the design and optimisation of tunnel longitudinal ventilation Cristian Biotto Aurecon	TBA	Leveraging Virtual Reality and visualisation tools in the rail sector Michael Gardiner Aurecon	Improving rail stressing production efficiency Daniel Buntine Aurizon
1635-1700	Simplicity - Smart Railways' Secret Sauce Dr Frank Heibel Doc Frank Training & Consulting	Raising the bar: A cultural-historical deconstruction of rail level crossings and their future relevance Assoc. Prof. Anjum Naweed Central Queensland University	Computerised Maintenance Management Systems for Railways using Big Data Malcolm D'Cruz, Rio Tinto & David Lim Independent Consultant	Automation and Expert Systems: Rail: Smart, Automated and Sustainable Asher Mushaurwa Rio Tinto	A Formation Standard for a Mature Rail Network Evan Giles & Daniel Headifen WSP New Zealand
1705-1730	Barriers to knowledge sharing in the rail industry: why are papers retracted? David Caldwell Snc-Lavalin	TBA	Achieving Light Rail Consistency, Interoperability and Standardisation in a Sustainable Way Kenelm Wong & Michael Uhlig Assest Standards Authority	Toowoomba Range Clearance Upgrade: protecting the past while designing for the future Daniel Caldwell WSP AUSTRALIA	Research, development and use of Stabilisation Geogrids to extend track maintenance intervals and reduce costs Michael Horton Tensor International
1730-1900	Networking reception The Gallery				
Wednesday 02 May 2018					ROOM
0700 -1930	Registrations Open				Foyer – Level 2
0730 -0815	Conference Presenter & Session Chair – Meet-up				Foyer – Level 2
0730 -1600	Exhibition open				The Gallery
0830 -1015	Plenary Session				Pymont Theatre
0830-0835	CORE 2018 – Day 2 Welcome - Sally Dominguez, Master of Ceremonies				
0840-0845	CORE 2018 – Host sponsor address – Transport for New South Wales				
0845-0930	Keynote Speaker 2 – Jean-Pierre Loubinoux, Director General, UIC				
0935-1015	Keynote Speaker 3 – SETE keynote speaker				
1015-1045	MORNING TEA The Gallery				
	Session 4 a (Shared SETE 2018 concurrent session) Session Chair: TBA	Operations General Session 4 b Session Chair: David Caldwell	Rollingstock/Track Interaction Session 4 c Session Chair: Peter Mutton	Electrical Advances Session 4 d Session Chair: Philip Pearce	Track Maintenance General Session 4 e Session Chair: John Terrey
1045-1110		Fleet Operation Planning and Rostering Tool (FORT) Mahdi Athari Vline	Advanced Friction Measurements and their Application for Locomotive Traction – Track Damage Studies Prof. Maksym Spiryagin Central Queensland University	The Impact of Rectifier Interphase Transformer design on Stray Current Levels in DC Traction Systems Dr Robert Barr & David Stuart-Smith Electric Power Consulting	Integration of weather forecasting for pre-emptive asset management Daniel Rodgers JBP
1115-1140		Reading the Tea Leaves: Interpreting Historical Suburban Railway Patronage Data Alex Wardrop Independent Railway Operations Research Consultant	Simulations of track-locomotive interactions Dr Qing Wu Central Queensland University	Root cause analysis of harmonic filter component failure in 2x25 kV traction power system Umberto Cella Aurizon	Risk based earthworks asset review of Aurizon rail network Andrew Doe Aurizon

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1145-1210		Canberra rail - to be or not to be Max Michell	Curve Drag Again Frank Szanto Downer Rail	Smart geometries for a new aluminium cantilever: OMNIA System Matteo Porreca Infraco Systems Pty Ltd	Wheel/Rail Interaction – A Sustainable Approach to Rail Infrastructure Design Surendra Bisht AECOM Australia	
1215-1240		Multi-Objective Optimisation for train allocation to diagrams for optimal improved maintenance and minimising customers' disruptions. Dr Kayode Owa The Nottingham University, United Kingdom	Advancements in AAR Braking Technology; New Control Valve & Parking Brake Features Karen Carriere Wabtec Corporation	Developments in Track Feeder Protection for AC Autotransformer Traction Networks Igor Perin Aurizon	Planning ballast and formation treatments with ground penetrating radar data integrated with 3d terrain models Damien Foun Aurizon	
1240-1330	LUNCH The Gallery	Session 5 a (Shared SETE 2018 concurrent session) Session Chair: TBA	Operations General Session 5 b Session Chair: Alex Wardrop	Infrastructure Sustainability Session 5 c Session Chair: Philip Campbell OAM	Electrical Automation Session 5 d Session Chair: David Stuart-Smith	Track Maintenance Sustainability Session 5 e Session Chair: Richard Dwight
1330-1355		General Rail Freight – Lost Cause or Golden Opportunity? Max Michell	BIM modelling of rail infrastructure Martin Harle GHD	Automated fault waveform analysis in 2x25 kV traction system: development and application to asset maintenance Umberto Cella Aurizon	Wheel and rail roughness and track decay rate estimation based on rail vibration measurement Dr Wenxu Li University of Wollongong	
1400-1425		Using digital innovation in the mass transit system environment Laura Stewart Aurecon	Urban planning challenges of accommodating freight rail intermodal facilities in major cities– Moorebank Intermodal Terminal Paul Greenhalgh WSP AUSTRALIA	How the Internet of Things is going to change Condition Monitoring of Rail Assets Thomas George Australian Rail Technology	Management options for existing and new rail in tangent and shallow curves Dr John Cookson Monash University	
1430-1455		Requirements Management – how 110,000 requirements are managed on Northwest Rapid Transit Chris Ramos Northwest Rapid Transit	Predicting the effectiveness of rail dampers on noise emissions – the first Australian trial Dr Luke Zoontjens SLR Consulting	Earthing and bonding philosophy and design challenges for Auckland's City Rail Link project Jody Martin & James Herbert Aurecon	The Application of Composite Sleepers Contributing to the Sustainability of Railway–Material Performance and Standard Development Dr Cong Qiu Institute of Railway Technology Monash University	
1500-1525		How can data shape a better railway system? Tim Blackburn & Doug Pickering ARUP	A New Strategic Asset Management Tool Catherine Laplante SNC-Lavalin	Remote Area Power Supply for Signalling and Communications in Aurizon's CQCN David Haley Aurizon	Rolling Stock and Track Geometry Influences on Derailment Risk due to Longitudinal Forces Don Skerman	

PROVISIONAL PROGRAM

1525-1605	AFTERNOON TEA The Gallery	
1605-1700	Closing Plenary Session	Pyrmont Theatre
1610-1650	Panel discussion	
1650-1655	CORE 2020 Announcement	
1655-1700	Conference close	
1700-1800	Young Professional farewell function	The Gallery
1830-2330	CORE 2018 Gala Dinner	Parkside Ballroom
Thursday 03 May 2018		
0900 -1700	Post-conference site tours – Multiple tours – half day option and full day option	
Friday 04 May 2018		
0900 -1700	Post-conference site tours – Multiple tours – half day option and full day option	



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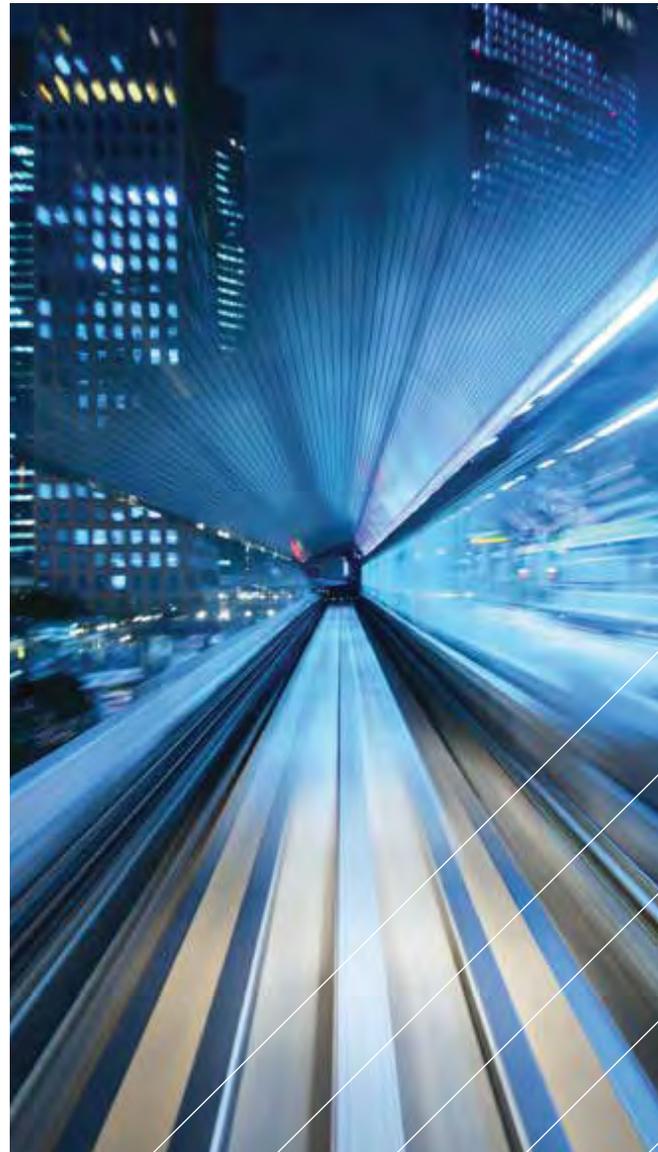
Providing data-driven strategies for the digital infrastructure future

Around the world, SNC-Lavalin is working side-by-side with clients to utilise technology and deliver sustainable data-driven business solutions for their unique operational needs.

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TECHNICAL TOURS

The committee is assembling an exciting technical tours program to be held pre and post CORE 2018. The technical tours will showcase the range of development of rail in and around Sydney and Newcastle including metro and light rail as well as looking at some heavy haul operations in the Hunter Valley. Please note that all tours are still in the development phase and are subject to final approvals and in some cases the completion of construction. Tours will be subject to minimum and maximum numbers as designated by each site and appropriate PPE will be enforced. A modest charge will be applied to cover costs. Please show your interest by ticking the appropriate box on the Registration Form. OPAL cards will be required for the tours.

Monday, 30th April – Pre-Conference Tours:

Morning - The new Sydney Trains Rail Operations Centre (ROC) at Green Square.

This new centre is planned to be commissioned in April 2018. Travel to the ROC will be by rail from Central to Green Square Station and a short walk from there.

Morning - Track Inspection Vehicles

We have applied to have Sydney Trains place the Mermac Track Inspection Vehicle at Central Station. This inspection would be combined with the visit to the ROC as above.

Afternoon - Sydney CBD Light Rail Project

A combined Light Rail and walking tour to inspect the new CBD light rail project and an inspection of at the depot and control centre at Pyrmont.

The tours will finish in time to allow early registration for CORE.

Thursday, 3rd May – Post-Conference Tours:

All day - North-West Rail

Traveling by rail from Central to inspect part of the Northern Sydney Freight line and the North Strathfield underpass on the Northern Line then visit the North-West Metro by coach at Rouse Hill to observe the above ground track structures and an inspection of new Cudgegong Rd Metro Depot, including a presentation of the project and an inspection of a driverless train set. Returning to Epping to inspect the current Epping to Chatswood Rail Link (ECRL) prior to its conversion to accommodate the driverless metro trains.

Morning - South West Rail Upgrades

The former Director of the Glenfield Overpass and the Liverpool Station Turnback Project Director will provide overviews of these projects. Suburban train from Central to Leppington to inspect the station, then to Glenfield and on to Liverpool station to view the turnback.

Friday, 4th May – Post-Conference Tours:



All day - Newcastle and Hunter Valley

Travel by train to Broadmeadow to inspect the ARTC Control Centre then the Newcastle Interchange and Light rail Project. Also visit the NCIG coal terminal and the Aurizon servicing facilities at Hexham.

This is a full day tour travelling from Central to Newcastle and coaching around the Hunter to inspect coal and rail facilities before an afternoon return to Sydney, coach and lunch will be provided.

Morning - South West Rail Upgrades

This tour is a repeat of the Thursday tour if there is sufficient interest.

SOCIAL PROGRAM



Welcome Reception

Date: Monday 30 April 2018

Time: 5.30pm – 7.30pm

Cost: Inclusive for full delegates and exhibitor registrations
Additional tickets: \$80 per person

Dress: Smart Casual

Delegates and exhibitors are invited to the Welcome Reception. This is an opportunity for us to welcome you to the Conference and for you to meet and mingle with other participants or rekindle past friendships.



Networking Session

Date: Tuesday 01 May 2018

Time: 5.30pm – 7.30pm

Cost: Inclusive for full delegates and exhibitor registrations
Additional tickets: \$80 per person

Dress: Smart Casual

At the conclusion of Day 1 enjoy a casual drink and nibbles amongst the CORE exhibition and knowledge zone. Catch up with the other delegates in relaxed surrounds.



WSP Gala Dinner

Date: Wednesday 02 May 2018

Time: 7.00pm – Late

Cost: Inclusive for full delegates and exhibitor registrations
Additional tickets: \$150 per person

Dress: Lounge Suit / Cocktail

The social highlight and perfect end to CORE 2018 – enjoy delicious food and fine wine and be entertained by one of Australia's best comedians.

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ACCOMMODATION OPTIONS

If you are looking for accommodation options within walking distance of the CORE 2018 Conference venue, please refer to the options listed below.

Please check the accommodation websites for current rates at time of booking. Please see below for a detailed map.

Sofitel Sydney Darling Harbour	1 min walk to Conference venue
Novotel & Ibis Sydney on Darling Harbour	3 min walk to Conference venue
Oaks Goldsbrough Apartments	5 min walk to Conference venue
Holiday Inn Darling Harbour	5 min walk to Conference venue
PARKROYAL Darling Harbour	10 min walk to Conference venue
The Darling Hotel	10 min walk to Conference venue
Adina Apartment Hotel Sydney Darling Harbour	15 min walk to Conference venue
Seasons Harbour Plaza Sydney	15 min walk to Conference venue
Mantra on Kent	20 min walk to Conference venue
Hyatt Regency Sydney	20 min walk to Conference venue

WHERE TO STAY

- Sofitel Sydney Darling Harbour
- Novotel Sydney on Darling Harbour
- ibis Sydney Darling Harbour
- The Darling Hotel and Spa
- Astral Towers & Residences
- Oaks Goldsbrough Apartments
- Adina Apartment Hotel Sydney, Darling Harbour
- Metro Apartments on Darling Harbour
- Hyatt Regency Sydney
- Park Royal Darling Harbour Sydney
- Novotel Rockford Darling Harbour
- Holiday Inn Darling Harbour
- Novotel Sydney Central
- Mecure Sydney
- Metro Hotel Sydney Central
- Meriton Serviced Apartments Campbell Street
- Rydges World Square
- Meriton Serviced Apartments World Tower
- Meriton Serviced Apartments Kent Street
- Frasers Suites Sydney
- Radisson Hotel and Suites Sydney
- Rydges Sydney Central
- Hyde Park Inn
- Song Hotel, Sydney
- Pullman Sydney Hyde Park
- Meriton Serviced Apartments Pitt Street
- Hilton Sydney
- Sheraton On The Park
- QT Sydney
- Swissotel Sydney
- The Westin Sydney
- The Menzies
- Radisson Blu Plaza Hotel Sydney
- Sofitel Sydney Wentworth
- Establishment Hotel Sydney
- Amora Hotel Jamison Sydney
- Sydney Harbour Marriott at Circular Quay
- InterContinental Sydney
- Sir Stamford at Circular Quay Hotel
- Pullman Quay Grand Sydney
- Four Seasons Hotel
- Quay West Suites Sydney
- Shangri-La Hotel
- The Harbour Rocks Hotel
- Ovolo Woolloomooloo
- Park Hyatt Sydney
- Pier One Sydney Harbour
- The Langham Sydney
- Quest Potts Point



SYDNEY, NEW SOUTH WALES

Discover Australia's most beautiful city, from the iconic Sydney Opera House and sparkling blue Sydney Harbour to fabulous beaches, delicious food and blockbuster shows. Climb the Sydney Harbour Bridge, cruise the harbour, explore national parks, and meet incredible wildlife.

You'll be amazed with the many wonderful things to do and see throughout the year. An exciting events calendar includes spectacular Vivid Sydney and the world-famous New Year's Eve fireworks. Visit zoos and aquariums, picnic in harbourside parks, go whale watching, and relax on Bondi Beach.



REGISTRATION FEES & ENTITLEMENTS

How to register

Registrations can be made online through the conference website: www.core2018.org/register

Registration information

The registration desk will be located on level 2 of the ICC. The desk will be open as follows:

Monday 30 April 2018:
2.00pm – 7.30pm

Tuesday 01 May 2018:
7.00am – 7.00pm

Wednesday 02 May 2018:
7.30am – 7.30pm

Full delegates are required to register prior to the commencement of the Opening Keynote Address. Day registrations are required to register on the morning of the first day of their attendance. Upon registration delegates will be issued with their registration pack including delegate bag, program, social event tickets and name badge.

Payment

Registration forms must be accompanied by payment of the registration fees.

Payment can be made in the following manner:

1. Credit Card

(Visa, MasterCard, AMEX only)
Any payments made using a VISA, Mastercard, American Express will incur a 1.5% surcharge at the time of payment.

2. EFT Payment

BSB: 062910
Account Number: 00900330
Bank: Commonwealth Bank
Swiftcode: CTBAAU25
Account Name: Institution of Engineers Australia

For EFT Payments please ensure the remittance advice is emailed to: accounts@engineersaustralia.org.au and your surname is quoted as the reference.

Registration fees

(All fees are in Australian Dollars and inclusive of GST)

REGISTRATION TYPE	EARLY BIRD (before 30/01/2018)	STANDARD (after 30/01/2018)
RTSA, EA & Engineering NZ Member Full Registration	\$990	\$1,250
Non Member Full Registration	\$1,250	\$1,500
RTSA, EA & Engineering NZ Member Day Registration	\$650	\$650
Non Member Day Registration	\$750	\$750
Group registration of 3	\$840 each	\$1190 each
Group registration of 5	\$790 each	\$1040 each

Registration fee entitlements

REGISTRATION INCLUSIONS	FULL DELEGATE / PRESENTER	DAY DELEGATES (applicable on nominated day only)	EXHIBITORS
Access to Sessions	✓	✓	✗
Delegate Bag including Program	✓	✓	✓
Tea Breaks & Lunches	✓	✓	✓
Entrance to Exhibition	✓	✓	✓
Welcome Reception	✓	✗	✓
Networking Session	✓	✗	✓
WSP Gala Dinner	✓	✗	✗

Cancellation policy

Should you be unable to attend, a substitute delegate is welcome.

All cancellations or alterations to registration must be made in writing to the Conference Secretariat. All registration forms will be received and accepted in good faith and processed as registered. Cancellations of a registration and nonattendance at CORE 2018 with any registration fee not paid will still require payment.

Cancellation	Refund
60 days prior to CORE 2018	Full Refund
Between 30 to 59 days prior to CORE 2018	75% Refund of Registration Fee
29 days prior to CORE 2018	No Refund (application for refund will be considered under exceptional circumstances)

Please note that all refunds will be issued following the Conference.

GENERAL INFORMATION

Child Care

Please note that no official arrangements have been made for child care during the conference. Please check with the hotel you are staying at who may be able to assist you further with babysitting services during your stay.

Climate

The average maximum temperature in May is 20°C and the average minimum temperature is 10°C.

Communication

All communication with registered delegates will be by email wherever an email address is provided. If you register and do not receive a confirmation either by email within 3 working days please contact the Conference Secretariat by phone on +61 (0) 7 3226 3026

Dress

Welcome Reception: Smart Casual

Conference Sessions: Smart Casual

Networking Session: Smart Casual

WSP Gala Dinner: Lounge Suit/Cocktail Wear

Insurance

Registration fees do not include insurance of any kind. It is strongly recommended that all delegates take out their own travel and medical insurance prior to coming to the conference.

The policy should include loss of fees/ deposit through cancellation of your participation in the conference, or through cancellation of the conference itself, loss of airfares for any reason, medical expenses, loss or damage to personal property, additional expenses and repatriation should travel arrangements have to be altered. Neither the conference secretariat nor the organising committee will take any responsibility for any participant failing to insure. Please speak to your travel agent or airline in regard to this matter.

Meals

All meal breaks and lunches will be served within the trade exhibition area. We recognise that some delegates may have special dietary requirements. Please advise the conference secretariat via the registration form or in writing should you require alternative arrangements be made on your behalf.

Please Note: Dietary requirements received less than 5 days prior to the event cannot be guaranteed.

Parking*

ICC Sydney operates two 24 hour car parking stations with a total of 826 parking spaces including 11 disabled parking bays, 25 motorcycle parking spaces, 50 bicycle racks and 20 electric car charge spaces. Please visit the ICC website for the car parking charges.

*Price may be subject to change without notice

Privacy Statement

In registering for this event relevant details may be listed on a delegate list for the benefit of all delegates, sponsors, exhibitors, RTSA & Engineers Australia and other parties directly related to the conference. Should you wish for your details not to be included in this list, please tick the privacy requested box on the registration form.

Smoking Policy

The ICC has a no smoking policy.

Travel and Transport

Airport Transfer

Taxis are easily available at a cost of approximately AU\$80 (depending on the time of day). Public transport from the airport to the city is also straightforward and Airport Shuttle runs between the airport and most major city hotels.

Please liaise directly with your hotel or travel agent if you require the Airport Shuttle.

VISAS

All international travellers (with the exception of New Zealand passport holders) must obtain a valid visa before travelling to Australia. For international delegates, this process is extremely simple. Through the Australian Electronic Travel Authority (ETA) system, travellers from a range of countries can apply for an ETA on the Internet, through a travel agent or airline. The ETA is the electronic equivalent of a visa for the short-term traveller, which replaces the passport visa label or stamp. Most online applications are processed instantly with travellers enjoying the added benefit of faster processing at the airport. Approved applications are electronically recorded on Australian Government systems and can be electronically confirmed by airline check-in staff prior to boarding. For visitors who are not eligible for an ETA, Australian visitor visas may also be issued on the spot or in most cases within 24 hours at Australian Embassies and Consulates overseas.

Getting Around Town

Sydney's public transport system features a comprehensive network of train, bus and ferry services. Light rail lines, airport links, sightseeing buses and taxi services complement the network.

Opal card:

You can get a free smartcard ticket to load funds for use on trains, buses, ferries and light rail. The Opal card can be used on the transport network extending beyond the city to the Blue Mountains, Central Coast, Hunter, Illawarra and Southern Highlands regions surrounding Sydney.

Transport Info

The NSW government's Transport Info site can help you plan your trip, even if it involves changing modes of public transport. Use the site to calculate the best way to get from A to B when travelling to or around the City of Sydney. It also provides fare and timetable information.

Sydney Trains:

Train stations in central Sydney include Central, Museum, St James, Town Hall, Wynyard, Circular Quay, Martin Place and Kings Cross. They are easy to travel between or to hook up with services going to the northern, southern and western suburbs. Trains to the eastern suburbs, including Bondi Junction, en route to the famous Bondi Beach leave from Martin Place Station.

Services run from 4am to around midnight on most train lines. Information kiosks can be found at Central and Circular Quay stations. All stations on the network have 24 hour ticket vending machines.

NSW TrainLink:

Sydney's vast metropolitan train network not only links the wider region with the city, it also

travels to nearby major cities and attractions like Newcastle and the Hunter Valley region to the north, Wollongong to the south and the Blue Mountains to the west.

NSW TrainLink also operates rail services to and from regional centres and holiday destinations such as Port Macquarie, the Snowy Mountains, Dubbo, Tamworth and Broken Hill. Central Station is the main terminal for country services. Trains to Canberra, Brisbane and Melbourne also leave from Central.

Sydney Buses:

Sydney Buses travel through the city and beyond almost 24 hours a day. Most of the bus routes within the City of Sydney are prepaid only to reduce delays, so you'll need to buy a ticket before you get on board. There are ticket outlets all over the city and you can usually find one near bus stops.

Airport Link:

The airport line operates from all City Circle stations to the domestic (T2 and T3) and international terminals (T1) every 10 minutes or so. The trip will take between 10 and 20 minutes, depending on where you get on and where you are going. The line runs from around 5am until midnight, 7 days a week. Station access fees are payable if you use either Domestic or International stations.

Light rail:

Transdev operates the light rail network connecting (zone 1) Central Station, Capitol Square, Paddy's Market, Exhibition Centre, Convention, (zone 2) Pyrmont Bay, The Star, John Street Square, Sydney Fish Market, Wentworth Park, Glebe, Jubilee Park, Rozelle Bay and Lilyfield. Central to Lilyfield travel time is around 25 minutes.

Services operate daily every 15 minutes from Central to Lilyfield between 6am and 11pm Monday to Thursday and between 6am to midnight Friday and Saturday. There is a 24 hour service from Central to The Star operating every 15 minutes from 6am to midnight then every 30 minutes until 6am.

The City of Sydney welcomed the NSW Government's announcement that work will soon begin on a \$1.6 billion light rail line along George Street, connecting Randwick with Circular Quay.

Harbour City Ferries:

Ferry services across Sydney's world-renowned harbour leave from the terminal at Circular Quay and travel to an array of harbourside destinations including Taronga Zoo and suburbs such as Balmain, Kirribilli, Neutral Bay, Mosman and Rose Bay.

Services also travel to the northern reaches of the harbour at Manly and west along the Parramatta River. Information kiosks are located at Circular Quay and Manly.

Taxis:

Taxis in Sydney can be hailed from the kerb on the street or engaged at one of several designated taxi ranks throughout the city centre. Taxis can also be booked directly with one of numerous private taxi companies operating across the city.

Car Rental:

Sydney Airport has several car rental companies located at the arrivals level at both terminals. Search and compare the best deals from quality rental car providers like Avis, Hertz, Europcar, Budget, Thrifty and Redspot at: <https://www.sydneyairport.com.au/info-sheet/rental-car>

We deliver end-to-end solutions.



Aurizon is a world-leading rail freight company delivering more than 250 million tonnes annually. We deliver innovative, best-in-class rail solutions including end-to-end rail infrastructure, innovations in rollingstock maintenance and automation of condition assessment.

Aurizon design, procure, construct, maintain and manage above and below rail assets with a **ZERO**Harm safety culture.

- Australia's leading rail infrastructure solutions provider.
- World-leading wayside monitoring technology.
- Innovation in rollingstock maintenance including On-Train-Repair (OTR).
- State-of-the-art asset management systems, methodologies and processes.
- **ZERO**Harm safety culture is at the core of everything we do.
- Outstanding portfolio of rail projects and experience to leverage.

Our Core Capabilities

RAILWAY PLANNING AND ENGINEERING

- Expert technical advice
- Greenfield and brownfield infrastructure planning and design
- Signalling and telecommunication specialists
- Design standards
- Integrated supply chain planning and simulation
- Network wayside monitoring and detection systems

RAILWAY CONSTRUCTION AND MAINTENANCE

- Railway structures, bridges, culverts, earthworks and drainage
- Resurfacing, track construction, rail grinding and ballast cleaning
- Electrical traction, signalling and telecommunication systems
- Environmental assessments, noise, dust and community impacts
- Mobile and fixed plant flash butt welding

RAILWAY OPERATIONS

- Access regimes
- Network control and asset management
- Rail management including incidents, emergencies and corridor access
- Network safety management systems and accreditation
- Condition based and predictive rollingstock maintenance
- Rollingstock inspection automation

Contact us

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CORE2018

CONFERENCE ON RAILWAY EXCELLENCE



Conference
Secretariat

RTSA

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Disclaimer: The information in this brochure is correct at the time of printing and publishing, RTSA & Engineers Australia reserve the right to change any aspect of the conference and program without prior notice. Please always refer to the conference website for conference updates.

