# JRC 2022

## Joint Rail Conference

*Kicking Off the Next 100 Years of Rail Innovation*

**CONFERENCE**
**April 20–21, 2022**

**Virtual Conference**

# Program

**https://event.asme.org/Joint-Rail-Conference**

*The American Society of Mechanical Engineers®*
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ASME
SETTING THE STANDARD

# Table of Contents

## Co- Chair's Welcome Message

The 2022 Joint Rail Conference (JRC) is the principal, multi-disciplinary, rail and transit research conference in North America, and the conference theme is ***Kicking Off the Next 100 Years of Rail Innovation***. This year's conference will again be held virtually, but we are looking forward to gathering safely in person next year in Baltimore, Maryland for the 2023 JRC.

The conference program has two days of concurrent presentation sessions, a special workshop on vehicle inspection, and an invited speaker. The technical sessions will cover all aspects of railroad civil, mechanical, electrical, and systems engineering topics, as well as rail safety, planning, design, financing, operations, and management. The JRC 2022 Conference Tracks are listed below:

- Railroad Infrastructure Engineering
- Rail Equipment Engineering
- Signal & Train Control Engineering
- Service Quality & Operations Research
- Planning and Development
- Safety and Security
- Energy Efficiency and Sustainability
- Urban Passenger Rail Transport
- Electrification
- Vehicle-Track Interaction
- Railroad History
- New Technologies

The JRC is a cooperative effort of the seven co-sponsoring organizations, IEEE, ASCE, ASME, AREMA, TRB, INFORMS, NuRAIL, and APTA. We'd like to extend our deepest appreciation to the volunteers and ASME staff, who have worked tirelessly to make this conference a success. Thank you and enjoy the presentations. We look forward to seeing you next year in Baltimore, Maryland!

**David Thurston. P.E., P.Eng. PhD, HonFIRSE**
JRC Co-Chair and IEEE VTS Vice President Land Transportation
Chief Engineer – Train Control
Canadian Pacific Railway, Calgary, AB Canada

**Dave Schlesinger, MSTM**
JRC Co-Chair and Rail Transportation Division Chair
Director of Program Excellence
Parsons Corporation, Ontario, California

# GENERAL INFORMATION

## REGISTRATION FEES

**Full Conference Rates**

ASME Member/Author: $299
ASME Non-Member: $349
Life Member: $189
ASME Student Member: $189
Student Non-Member: $229

**Full Registration Includes:** Access to Technical Sessions, Keynotes, Grand Challenge, On-line access to all technical presentations, OnDemand presentations available for 30 days after the conference and the conference proceedings.

**Cancellation Policy:** No refunds will be allowed.

**Substitutions:** Registrations may not be transferred or substituted at any time.

**Student Registration Fees:** Student registration rates are only available to undergraduate and graduate students who are enrolled full time and have not yet received their Ph.D. Post-docs may not register as students.

**Presentation Policy:** All scheduled presentations must be presented via video, and authors will be available for the Q&A after all the presentations in their session. “Technical Publication” type presentations will be published after the conference, only if the presentation is done by an Author or Co-Author of that paper. “Technical Presentations” are not scheduled to be published.

**For registration questions, please contact:**
Email: Events@asme.org
Call: 212-591-7791
Hours: Monday–Friday (8am–6pm EST)

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**Event Cancellation:** If the event is cancelled, conference attendees will be returned the registration fee only. Any fees associated with cancellation of travel or housing reservations are the exclusive responsibility of conference attendees.

**AMERICAN SOCIETY OF MECHANICAL ENGINEERS INTERNATIONAL**

**Mission:** ASME's mission is to serve diverse global communities by advancing, disseminating and applying engineering knowledge for improving the quality of life; and communicating the excitement of engineering.

**Vision:** ASME aims to be the essential resource for mechanical engineers and other technical professionals throughout the world for solutions that benefit humankind.

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It is easy to apply, and the benefits include the fellowship and recognition from being associated with one of the largest engineering societies in the world. ASME members and student members, and members from select countries can receive a discount on their conference registration. You can apply for ASME membership by registering online. Alternatively, you can call 1-800-THE-ASME (800-843-2763) or outside North America 973-882-1167 and ASME will mail you an application, or you can email https://www.asme.org/membership/membership-benefits to request an application.

For questions about the conference and registration, please contact, **Mary Jakubowski, CMP** Manager, Events Management, Tel: 212-591-7637, Fax: 212-591-7856, Email: jakubowskim@asme.org.

"No shows" are not refundable and are liable for the full registration fee.

## THE ASME RAIL TRANSPORTATION DIVISION

The ASME Rail Transportation Division is entirely composed of volunteers from the railroad industry. If you are interested in participating, please contact a conference organizer or email Steve Dedmon at dedmon1@verizon.net.

## PROFESSIONAL DEVELOPMENT HOURS RECORD FORMS

Participation record forms will be provided upon request to conference attendees who need to track their number of professional development hours (PDHs). Forms are available by emailing the Conference manager, Mary Jakubowski at jakubowskim@asme.org. Conference attendees should check the rules of their appropriate State licensing body to see if participation in this conference will qualify for credit to maintain a P.E. license or other professional certification.

## TAX DEDUCTIBILITY

Expenses of attending professional meetings have been held to be tax deductible as ordinary business expenses for U.S. citizens. Because of changes in the tax code, the current level of deduction is subject to change.

## PUBLICATION SALES

All JRC Technical Papers are available electronically to registered attendees only. Attendees will receive electronic access via their email on record. Additional copies of the JRC Proceedings can be ordered from: **ASME Order Department, 150 Clove Road, 6th Fl, Little Falls, NJ 07424-2139**

# 2022 JRC SCHEDULE

**Please Note: The Program Agenda can be found on the website under the Program page: https://event.asme.org/Events/media/library/resources/jrc/JRC-2022-Schedule-at-a-Glance.pdf with all presentation assignments. The times are in Eastern Daylight Savings time. Detailed presentations can be found starting on page 18 of this program.**

## WEDNESDAY, APRIL 20

| Date | Event | Virtual Room |
|---|---|---|
| 10:00AM–12:00PM | **Opening Remarks**<br>**Technical Workshop - Current Wayside and Vehicle Inspection Technology Workshop - Dr. Allan M. Zarembski** | **Room 2** |
| 12:00PM–01:00PM | **Lunch Break** | |
| 01:00PM–02:00PM | **Track 1-A – Railroad Infrastructure Engineering** | **Room 1** |
| 01:00PM–02:00PM | **Track 2-A – Rail Equipment Engineering** | **Room 2** |
| 01:00PM–02:00PM | **Track 3-A – Signal and Train Control Engineering** | **Room 3** |
| **02:00PM–02:10PM** | **Break** | |
| 02:10PM–03:10PM | **Track 1-B – Railroad Infrastructure Engineering** | **Room 1** |
| 02:10PM–03:10PM | **Track 2-B – Rail Equipment Engineering** | **Room 2** |
| 02:10PM–03:10PM | **Track 3-B – Signal and Train Control Engineering** | **Room 3** |
| **03:10PM–03:20PM** | **Break** | |
| 03:20PM–04:35PM | **Track 1-C – Railroad Infrastructure Engineering** | **Room 1** |
| 03:20PM–04:35PM | **Track 7-A – Energy Efficiency and Sustainability** | **Room 2** |
| 03:20PM–04:35PM | **Track 6-A – Safety and Security** | **Room 3** |
| 04:35PM–05:50PM | **Track 1-D – Railroad Infrastructure Engineering** | **Room 1** |
| 04:35PM–05:50PM | **Track 4-A – Service Quality and Operations Research** | **Room 2** |
| 04:35PM–05:50PM | **Track 6-B – Safety and Security** | **Room 3** |

## THURSDAY, APRIL 21

| Date | Event | Virtual Room |
|---|---|---|
| 10:00AM–11:15AM | **Track 10-A – Vehicle Track Interaction** | **Room 1** |
| 10:00AM–11:15AM | **Track 6-C – Safety and Security** | **Room 2** |
| 10:00AM–11:15AM | **Track 12-A – New Technologies** | **Room 3** |
| | | |
| 11:15AM–12:30PM | **Track 10-B – Vehicle Track Interaction** | **Room 1** |
| 11:15AM–12:30PM | **Track 8-A – Urban Passenger Rail Transport** | **Room 2** |
| 11:15AM–12:30PM | **Track 12-B – New Technologies** | **Room 3** |
| **12:30PM–12:40PM** | **Break** | |
| 12:40 PM–01:55PM | **Track 11-A – Railroad History** | **Room 1** |
| 12:40 PM–01:55PM | **Track 9-A – Electrification** | **Room 2** |
| 12:40 PM–01:55PM | **Track 12-C – New Technologies** | **Room 3** |
| | | |
| **01:55PM–02:55PM** | **Track 12-D – New Technologies** | **Room 3** |
| **02:55PM–03:00PM** | **Break** | |
| 03:00PM–04:00PM | Best Paper **Award & Keynote: Matthew Pollack, MDOT** | |

# WORKSHOP

**Tuesday, April 20**
**10:00AM–12:00PM**
**Room 2**

## Current Wayside and Vehicle Inspection Technology

**Dr. Allan M. Zarembski, P.E., Hon. Mbr. AREMA, FASME**
**Professor of Practice and Director of Railroad Engineering and Safety Program**
**Department of Civil and Environmental Engineering**
**University of Delaware, Newark, DE**

**About the Presenter:** Dr. Zarembski is an internationally recognized authority in the fields of track and vehicle/track system analysis, railway component failure analysis, track strength, and maintenance planning. Dr. Zarembski is currently Professor of Practice and Director of the Railroad Engineering and Safety Program at the University of Delaware's Department of Civil and Environmental Engineering, where he has been since 2012. Prior to that he was President of ZETA-TECH, Associates, Inc., a railway technical consulting and applied technology company he established in 1984. He also served as Director of R&D for Pandrol Inc., Director of R&D for Speno Rail Services Co., and Manager, Track Research for the Association of American Railroads. He has been active in the railroad industry for over 40 years.

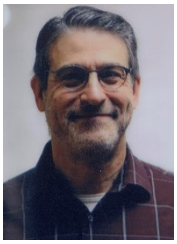
Dr. Zarembski has a PhD (1975) and M.A. (1974) in Civil Engineering from Princeton University, and an M.S. in Engineering Mechanics (1973) and B.S. in Aeronautics and Astronautics from New York University (1971). He is a registered Professional Engineer in five states. Dr. Zarembski is Honorary Member of AREMA, Fellow of American Society of Mechanical Engineers (ASME), and a Life Member of American Society of Civil Engineers (ASCE). He served as Deputy Director of the Track Train Dynamics Program and was the recipient of the American Society of Mechanical Engineer's Rail Transportation Award in 1992 and the U.S. Federal Railroad Administration's Special Act Award in 2001, and the Fumio Tatsuoka Best Paper Award 2017 by the *Journal of Transportation Infrastructure Geotechnology*.

Dr. Zarembski has authored or co-authored over 220 technical papers, over 120 technical articles, two book chapters, and two books.

# Keynote

**Thursday, April 21**
**3:15PM–3:35PM**

**Matthew Pollack, PE, PMP**
**Executive Director at Maryland Transit Administration**
**Washington, D.C., United States**



**Matt Pollack, PE, PMP,** is MDOT MTA's Executive Director of Transit Development and Delivery for the Purple Line. A Montgomery County native, Pollack is excited to help deliver the transformative 16-mile light rail project being built between Bethesda in Montgomery County and New Carrollton in Prince George's County. Pollack, a Professional Engineer (PE) and Project Management Professional (PMP) with over 30 years of experience in management, operations, project delivery, problem solving, and team building, joined the Purple Line in 2020. He served as Vice President/Senior Program Manager for HNTB for six years prior to joining MDOT MTA. In his various roles, he has provided management and technical services to transit clients worldwide, including the Washington Metropolitan Area Transit Authority (WMATA). He has a Master of Science degree in Electrical Engineering from The Johns Hopkins University and a Bachelor of Science degree in Electrical Engineering, Computer Engineering & Math from Carnegie Mellon University. Pollack is a Springbrook High School graduate and father of three who lives with his wife in Laurel.

# ACKNOWLEDGMENTS

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## TRB

**CO-CHAIR: OPEN**

# Tracks & Track Chairs

| Track | Chair | |
|---|---|---|
| **1 – Railroad Infrastructure Engineering** | Stephen Wilk, *TTCI* | **Co-Chair** |
| **2 – Rail Equipment Engineering** | Mehdi Ahmadian, *Virginia Tech* | Milad Hosseinipour, *IEEE* |
| **3 – Signal and Train Control Engineering** | Dave Thurston, *CPR Rail* | Lamont Ward, *Amtrak* |
| **4 – Service Quality and Operations Research** | Clark Cheng, *Norfolk Southern* | Rapik Saat, *AAR* |
| **6 – Safety and Security** | Dave Schlesinger, *Parsons* | |
| **7 – Energy Efficiency and Sustainability** | Brian Donohue, *WSP* | |
| **8 – Urban Passenger Rail Transport** | Brian Donohue, *WSP* | |
| **9 – Electrification** | John Grantham, *IEEE* | Bih-Yuan Ku, *National Taipei University of Technology* |
| **10 – Vehicle Track Interaction** | Anand Prabhakaran, *Sharma & Associates* | |
| **11 – Railroad History** | Timothy Mast, *Wabtec* | |
| **12 – New Technologies** | Mehdi Ahmadian, *Virginia Tech* | Milad Hosseinipour, *IEEE* |

# Technical Presentations

# WEDNESDAY, APRIL 20, 2022

**Track 1-A: Railroad Infrastructure Engineering**
4/20/2022
1:00PM–2:00PM - Room 1

Chair: ***Stephen Wilk - Transportation Technology Center, Inc.***

***Panel Discussion: Interaction Between Rail Infrastructure Component***
*Panel Presentation: JRC2022-84240*
*Stephen Wilk - Transportation Technology Center, Inc.*

***Effect of Prestressing Wire Indent Geometry on Transfer Length and Tie Splitting Propensity***
*Technical Paper Publication: JRC2022-79748*
*B. Terry Beck - Kansas State University*
*Aaron A. Robertson - Kansas State University*
*Robert J. Peterman - Kansas State University*

***Forecasting Track Geometry Degradation Using GPR Based Ballast Condition***
*Technical Paper Publication: JRC2022-79586*
*Allan Zarembski - University of Delaware*
*Joseph Palese - University of Delaware*
*Michael Nguyen - University of Delaware*

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**Track 2-A: Rail Equipment Engineering**
4/20/2022
1:00PM–2:00PM - Room 2

Chair: ***Timothy Mast, Wabtec***

***Panel Discussion: Improving Rail Equipment for Better Preparing for Future Pandemics***
*Panel Presentation: JRC2022-84440*
*Timothy Mast, Wabtec*

***Feasibility and Roadmap for Applying Model-Assisted Probability of Detection to Track Inspection***
*Technical Paper Publication: JRC2022-80208*
*Jay Baillargeon - Federal Railroad Administration*
*Daniel Einbinder - ENSCO, Inc.*
*Radim Bruzek - ENSCO, Inc.*
*John Tunna - Independent Consultant*

***Jerk Response Analysis in Rail Coaches Through Reduced Order Dynamic Simulations***
*Technical Presentation Only: JRC2022-87370*
*Manoj Pandey - Indian Institute of Technology Madras India*

**Track 3-A: Signal and Train Control Engineering**
4/20/2022
1:00PM–2:00PM - Room 3

Chair: ***David F. Thurston, CPR***
Co-Chair: ***Lamont Ward - Amtrak***

***A Method for High Fidelity Simulations of Railway Virtual Coupling***
*Technical Paper Publication: JRC2022-77987*
*Qing Wu - Central Queensland University*
*Xiaohua Ge - Swinburne University of Technology*
*Colin Cole - Central Queensland University*
*Maksym Spiryagin - Central Queensland University*

***Agile Model-Based Systems Engineering of Passenger Train Operational Design***
*Technical Paper Publication: JRC2022-78070*
*Josh Barrett - IKOS UK*
*Nan Wang - IKOS UK*
*Clara Carricajo - IKOS Consulting*
*Jeanne-Marie Dalbavie - IKOS Consulting*

***Power Over CTC: A Novel Way to Control Signal Power Supplies***
*Technical Paper Publication: JRC2022-77801*
*David F. Thurston - Canadian Pacific Railway*

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**Track 1-B: Railroad Infrastructure Engineering**
4/20/2022
2:10PM–3:10PM - Room 1

Chair: ***Stephen Wilk - Transportation Technology Center, Inc.***

***FEA Simulation of Residual Stress Development in Flash-Butt Welded Rail Joints of CWR Track***
*Technical Presentation Only: JRC2022-78060*
*Dimitris Rizos - University of South Carolina*
*Brennan Gedney - University of South Carolina*

***Effect of Polyurethane Stabilization and Coal Fouling on Drainage Behaviour of Railroad Ballast***
*Technical Paper Publication: JRC2022-77803*
*Dinesh Gundavaram - Indian Institute of Technology Patna*
*Syed Khaja Karimullah Hussaini - Indian Institute of Technology Patna*

***Landslide Risk Assessment in Cut Locations Using Right of Way Videos and Artificial Intelligence***
*Technical Paper Publication: JRC2022-78162*
*Michael Palese - University of Delaware*
*Allan M. Zarembski - University of Delaware*
*Joseph W. Palese - University of Delaware*

**Track 2-B: Rail Equipment Engineering**
4/20/2022
2:10PM–3:10PM - Room 2

Chair: ***Timothy Mast, Wabtec***

***Conductive Polymer Pad for Use in Freight Railcar Bearing Adapters***
*Technical Paper Publication: JRC2022-78217*
*Jesse Aguilera - University of Texas Rio Grande Valley*
*Constantine Tarawneh - University of Texas Rio Grande Valley*
*Harry Siegel - University of Texas Rio Grande Valley*
*Robert Jones - University of Texas Rio Grande Valley*
*Santana Gutierrez - University of Texas Rio Grande Valley*

***Transient Thermal Analysis of a Railroad Bearing Adapter for Optimal Placement of Onboard Sensors***
*Technical Paper Publication: JRC2022-78219*
*Javier Arroyo - University of Texas Rio Grande Valley*
*Constantine Tarawneh - University of Texas Rio Grande Valley*
*Arturo Fuentes - University of Texas Rio Grande Valley*
*Roberto A. Garcia - University of Texas Rio Grande Valley*
*Jose G. Gallegos - University of Texas Rio Grande Valley*

***Wear Depth Analysis for Rail-Car Wheels: Case of Addis Ababa Light Rail Transit Service***
*Technical Paper Publication: JRC2022-78160*
*Samrawit Abubeker - Addis Ababa University*
*Celestin Nkundineza - Addis Ababa University*

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**Track 3-B: Signal and Train Control Engineering**
4/20/2022
2:10PM–3:10PM - Room 3 - Tracks 3, 6, & 12

Chair: ***David Thurston - CPR***
Chair: ***Lamont Ward - Amtrak***

***Modeling and Performance Evaluations of an RF Transceiver System at 160 MHz for Railroad Environments***
*Technical Paper Publication: JRC2022-79579*
*Pejman Ghasemzadeh - University of Nebraska-Lincoln*
*Michael Hempel - University of Nebraska-Lincoln*
*Hamid Sharif - University of Nebraska-Lincoln*
*Tarek Omar - Federal Railroad Administration*

***Maximizing RF Communication Throughput for Railroad Applications at 160 MHz***
*Technical Paper Publication: JRC2022-79575*
*Pejman Ghasemzadeh - University of Nebraska-Lincoln*
*Michael Hempel - University of Nebraska-Lincoln*
*Hamid Sharif - University of Nebraska-Lincoln*
*Tarek Omar - Federal Railroad Administration*

**Track 1-C: Railroad Infrastructure Engineering**
4/20/2022
3:20PM–4:35PM - Room 1

Chair: ***Stephen Wilk - Transportation Technology Center, Inc.***

***Development and Verification of a Moment-Curvature Based Railroad Tie Analysis Program***
*Technical Paper Publication: JRC2022-79590*
*Yu-Szu Chen - Kansas State University*
*Christopher A. Jones - Kansas State University*
*Robert J. Peterman - Kansas State University*

***Quantifying Parameters That Affect Longitudinal Track Resistance***
*Technical Presentation Only: JRC2022-78171*
*Max Potvin - RailTEC*
*Marcus Dersch - RailTEC*
*Riley Edwards - RailTEC*
*Arthur De Oliveira Lima - RailTEC*

***Experimental Flexural Testing of Virgin and Post-Service Concrete Monoblock Tie for Computational Tool Development***
*Technical Paper Publication: JRC2022-78213*
*Yu-Szu Chen - Kansas State University*
*Robert J. Peterman - Kansas State University*
*Christopher A. Jones - Kansas State University*

***Estimating Uncertainties in Concrete Monoblock Railroad Tie Flexural Behavior Through Monte Carlo Simulation***
*Technical Paper Publication: JRC2022-78215*
*Yu-Szu Chen - Kansas State University*
*Christopher Jones - Kansas State University*
*Robert Peterman - Kansas State University*

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**Track 7-A: Energy Efficiency and Sustainability**
4/20/2022
3:20PM–4:35PM - Room 2

Chair: ***Brian Donohue - WSP USA***

***Climate Change and What's Ahead in North America for the Passenger and Freight Rail Industry***
*Panel Presentation: JRC2022-83731*
*Brian Donohue - WSP USA*

***Advanced Modelling and Performance Evaluation of Hydrogen-Powered Heavy Haul Locomotive***
*Technical Paper Publication: JRC2022-78005*
*Maksym Spiryagin - Central Queensland University*
*Frank Szanto - Downer Group, Rail & Transit Systems*
*Kevin Oldknow - Simon Fraser University*
*Peter Wolfs - Central Queensland University*
*Valentyn Spiryagin - Independent Railway Consultant*
*Sanjar Ahmad - Central Queensland University*
*Qing Wu - Central Queensland University*
*Esteban Bernal - Central Queensland University*
*Colin Cole - Central Queensland University*
*Tim Mcsweeney - Central Queensland University*

***Battery Electric Rail Technology Review: A Technical and Operational Assessment. Current Status, Challenges, and Perspective***
*Technical Paper Publication: JRC2022-78133*
*Fabio Barbosa - FCB Research*

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**Track 6-A: Safety and Security**
4/20/2022
3:20PM–4:35PM - Room 3

Chair: ***Dave Schlesinger – Parsons***
Panelist: ***Greg Placencia, Cal Poly Pomona***
Panelist: ***Larry Day, Federal Railroad Administration***

***Panel Discussion: Contemporary Issues in Rail Safety***
*Panel Presentation: JRC2022-80544*
*Dave Schlesinger - Parsons*

***Keeping Cyber Security on Track***
*Technical Presentation Only: JRC2022-80545*
*Dave Schlesinger - Parsons*

***Locomotive Stopping Location Compared to Walking Pedestrian in Trespasser Collisions***
*Technical Presentation Only: JRC2022-87014*
*Louis Rubenstein - Carl Berkowitz Associates*

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**Track 1-D: Railroad Infrastructure Engineering**
4/20/2022
4:35PM–5:50PM - Room 1

Chair: ***Stephen Wilk - Transportation Technology Center, Inc.***

***Parameters Affecting Lateral Track Strength After Surfacing***
*Technical Paper Publication: JRC2022-78724*
*Stephen Wilk - Transportation Technology Center, Inc.*

***Development of Basalt Fiber-Reinforced Engineered Cementitious Material for Prestressed Concrete Crossties***
*Technical Presentation Only: JRC2022-79548*
*Moochul Shin - Western New England University*
*Changhoon Lee - Western New England University*

***Development of Track Geometry Degradation Model & Review of Recovery Models***

*Technical Paper Publication JRC2022-79370*
*Daniel Wordofa – EDR*

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**Track 4-A: Service Quality and Operations Research**
4/20/2022
4:35PM–5:50PM - Room 2

Chair: ***Clark Cheng - Norfolk Southern Railway***
Chair: ***Rapik Saat - AAR***

***A Hybrid Simulation Approach for Analyzing Capacity and Safety of a Large-Scale Network Using a Benchmark Mini-Network Model***
*Technical Presentation Only: JRC2022-80306*
*Hamed Pouryousef - Sharma & Associates, Inc.*
*Monique Stewart - FRA, Office of Research, Development and Technology*
*Som Singh - Sharma & Associates, Inc.*
*Anand Prabhakaran - Sharma & Associates, Inc.*

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**Track 6-B: Safety and Security**
4/20/2022
4:35PM–5:50PM - Room 3

Chair: ***Dave Schlesinger - Parsons***

***Unique Challenges of a Brown Field Project's Safety Certification***
*Technical Presentation Only: JRC2022-78207*
*Amin Kalbasi - Parsons*

***Institutional Memory, Training, and Organizational Culture***
*Technical Presentation Only: JRC2022-78390*
*Dave Schlesinger - Parsons*
*Lee Mocon - Parsons*

***Dynamic Model of Resilient Wheel and Its Performance Comparison***
*Technical Paper Publication: JRC2022-79357*
*Xianting Hu - Tongji University*
*Zhao Xue - Tongji University*
*Jimin Zhang - Tongji University*

# THURSDAY, APRIL 21, 2022

**Track 10-A: Vehicle Track Interaction**
4/21/2022
10:00AM–11:15AM - Room 1

Chair: ***Anand Prabhakaran - Sharma & Associates, Inc.***

***Dynamic Amplification of Transit Loads Due to Derailment Impact***
*Technical Paper Publication: JRC2022-78032*
*John Lobo - HDR, Inc.*
*Robert MacNeill - Simpson Gumpertz & Heger Inc.*

***Implementation of the Contact Roughness at the Wheel-Rail Contact Model for Locomotive Traction Studies***
*Technical Paper Publication: JRC2022-84116*
*Shah Sanjar Nafis Ahmad - Central Queensland University*
*Maksym Spiryagin – CQ University*
*Esteban Bernal - CQ University*
*Kevin Oldknow - Simon Fraser University*
*Ingemar Persson - AB DEsolver*
*Qing Wu - CQ University*
*Colin Cole - CQ University*
*Tim Mcsweeney - CQ University*

***Wheel-Rail Contact Force and Traction Analysis Under Wet and Oil-Contaminated Conditions***
*Technical Paper Publication: JRC2022-78233*
*Ahmad Radmehr - Virginia Tech*
*Yu Pan - Virginia Tech*
*Ali Tajaddini - Federal Railroad Administration*
*Edwin Vollebregt - Vtech CMCC*
*Mehdi Ahmadian - Virginia Tech*

***Numerical Simulation of Train-Track Switch Interactions in the Presence of Surface Rail Defects for Determining Physical Sensor Placement for Structural Health Monitoring***
*Technical Paper Publication: JRC2022-79455*
*Nikhil Pillai - Birmingham Centre for Railway Research and Education, University of Birmingham*
*Jou-Yi Shih - Birmingham Centre for Railway Research and Education, University of Birmingham*
*Clive Roberts - Birmingham Centre for Railway Research and Education, University of Birmingham*

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**Track 6-C: Safety and Security**
4/21/2022
10:00AM–11:15AM - Room 2

Chair: ***Dave Schlesinger - Parsons***

***Hazard Management Plan for Mass Transit System***
*Technical Paper Publication: JRC2022-78000*
*James Li - Parsons Mobility Solutions*
*Andrew Howard - Parsons Mobility Solutions*
*Amin Kalbasi - Parsons Mobility Solutions*

***Cyber-Physical Security Framework for Rail Transportation Data Systems***
*Technical Paper Publication: JRC2022-78167*
*Arash Aziminejad - WSP*

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**Track 12-A: New Technologies**
4/21/2022
10:00AM–11:15AM - Room 3

Chair: ***Mehdi Ahmadian – Virginia Tech***
Co-Chair: ***Milad Hosseinipour – IEEE***

***Smart Switch: The Application of Fiber Optic Continuous Strain Sensing to the Railroad Turnouts***
*Technical Paper Publication: JRC2022-80438*
*Frank J. Smith - MACRO / Division of Ross & Baruzzini*
*Faeze Ghofrani - Pennsylvania State University - Altoona*

***Development of a Mobile Robot System for the Visual Inspection of Railcar Undercarriage Equipment***
*Technical Paper Publication: JRC2022-79739*
*Michael Molzon - Virginia Polytechnic Institute and State University*
*Mehdi Ahmadian - Virginia Tech*

***Onboard Installation of LiDAR Doppler Systems for Track Instability Measurements***
*Technical Presentation Only: JRC2022-79749*
*Mehdi Ahmadian - Virginia Tech*
*Timothy Mast - Wabtec*
*Ahmad Radmehr - Virginia Tech*
*Sayedmohammad Hosseini - Virginia Tech*
*Carvel Holton - Virginia Tech*

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**Track 10-B: Vehicle Track Interaction**
4/21/2022
11:15AM–12:30PM - Room 1

Chair: ***Anand Prabhakaran - Sharma & Associates, Inc.***

***Unleashing the Power of Data-Driven Statistical Models for Analyzing Complex Engineering Data***
*Technical Presentation Only: JRC2022-79562*
*Sayedmohammad Hosseini - Virginia Tech*
*Mehdi Ahmadian - Virginia Tech*

***Examination of Fast Track Geometry and Vehicle/track Interaction Exceptions***
*Technical Paper Publication: JRC2022-79569*
*Abe Meddah - Transportation Technology Center, Inc.*
*Silvia Galván-Núñez - Transportation Technology Center, Inc.*

***Friction-Slip Curves: The Pathway From Twin Disk Tribo Measurements to Full Scale Locomotive Multibody Simulations***
*Technical Paper Publication: JRC2022-84111*
*Esteban Bernal - Centre for Railway Engineering, Central Queensland University*
*Maksym Spiryagin - Centre for Railway Engineering, Central Queensland University*
*Sebastian Stichel - KTH*
*Nicola Bosso - Politecnico di Torino*
*Roger Lewis - The University of Sheffield*
*Christopher Bosomworth - Centre for Railway Engineering, Central Queensland University*
*Qing Wu - Centre for Railway Engineering, Central Queensland University*
*Colin Cole - Centre for Railway Engineering, Central Queensland University*

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**Track 8-A: Urban Passenger Rail Transport**
4/21/2022
11:15AM–12:30PM - Room 2

Chair: ***Brian Donohue - WSP USA***

***Automated People Mover Technology Review: A Mobility Tool for Large Capacity Airports and Connecting Transit Systems***
*Technical Paper Publication: JRC2022-78132*
*Fábio C. Barbosa - FCB Research & Consulting*

***Covid and Its Effects on Passenger Rail and Transit Technology***
*Panel Presentation: JRC2022-83732*
*Brian Donohue - WSP USA*

***Configuration Management and Meeting ISO Standard 10007:2017 for the Transit and Rail Industry***
*Technical Presentation Only: JRC2022-79737*
*Brian Donohue - WSP USA*

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**Track 12-B: New Technologies**
4/21/2022
11:15AM–12:30PM - Room 3

Chair: ***Mehdi Ahmadian – Virginia Tech***
Co-Chair: ***Milad Hosseinipour – IEEE***

***Modernizing Public Transport Design for a Digital Age: Decongesting Roads and Increasing Ridership Using Aeronautics***
*Technical Presentation Only: JRC2022-78086*
*Alex Thomas - Takniki Drishti*

***Fiber Optic System to Extend the Measuring Frequency Range of Pantograph Contact Force***
*Technical Paper Publication: JRC2022-78107*
*Luigi Calvanese - Politecnico di Milano*
*Marco Carnevale - Università degli Studi di Pavia*
*Alan Facchinetti - Politecnico di Milano*

***Pilot Field Test of an Onboard Wireless Health Monitoring System for Railroad Rolling Stock***
*Technical Paper Publication: JRC2022-78173*
*Marco A. Barrera - University of Texas Rio Grande Valley*
*Lee R. Cantu - University of Texas Rio Grande Valley*
*Constantine Tarawneh - University of Texas Rio Grande Valley*
*Heinrich Foltz - University of Texas Rio Grande Valley*
*Brent Wilson - Hum Industrial Technology, INC.*
*Byron Porter - Hum Industrial Technology, INC.*

***Predicting the Remaining Service Life of Railroad Bearings: Leveraging Machine Learning and Onboard Sensor Data***
*Technical Presentation Only: JRC2022-78174*
*Leonel Villafranca - University of Texas Rio Grande Valley*
*Mohamadhossein Noruzoliaee - University of Texas Rio Grande Valley*
*Constantine Tarawneh - University of Texas Rio Grande Valley*
*Abel Sanchez Trinida - University of Texas Rio Grande Valley*

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**Track 11-A: Railroad History**
4/21/2022
12:40PM–1:55PM - Room 1

Chair: ***Timothy Mast – Wabtec***
Panelist: ***Dave Schlesinger, Parsons***
Panelist: ***John Howard***
Panelist: ***Kelly Lunch***
Presenter: ***Bill Schoonmaker, Wabtec***

*Panel Discussion – Application of Positive Train Control (PTC) to Historical Equipment*
*Panel Presentation: JRC2022-83750*
*Timothy Mast - Wabtec*

*Progress in Railway Mechanical Engineering 2020-2021 Survey - Locomotives*
*Technical Paper Publication: JRC2022-78105*
*Timothy Mast – Wabtec*

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**Track 9-A: Electrification**
4/21/2022
12:40PM–1:55PM - Room 2

Chair: ***John Grantham - Atkins***
Panelist: ***Frank DeLizza, Atkins Global***
Panelist: ***Paul White, HNTB***

***Industry-Proven Methods for Grounding OCS Poles and Supports for At-Grade Foundations and on Aerial Structures for DC LRT Systems***
*Panel Presentation: JRC2022-80312*
*John Grantham - Atkins*

***Spring Tensioner Tensorex C+***
*Technical Presentation Only: JRC2022-78110*
*Thierry METRAT - PFISTERER North America Inc.*

**Track 12-C: New Technologies**
4/21/2022
12:40PM–1:55PM - Room 3

Chair: ***Mehdi Ahmadian – Virginia Tech***
Co-Chair: ***Milad Hosseinipour – IEEE***

***Performance of a Thermoelectric-Based Energy Harvesting Device on a Realistic Railroad Route***
*Technical Paper Publication: JRC2022-78200*
*Martin Amaro - University of Texas Rio Grande Valley*
*Constantine Tarawneh - University of Texas Rio Grande Valley*
*Heinrich Foltz - University of Texas Rio Grande Valley*
*Ruben Aguilera Toro - University of Texas Rio Grande Valley*
*Curtis Peña - University of Texas Rio Grande Valley*

***Intelligent Transit Thru Imaging: Using CCTV Cameras for Evaluating Real Time Demand***
*Technical Paper Publication: JRC2022-78323*
*Kshitij Saxena - Parsons*

***Machine Learning Based Estimation of Residual Useful Life of High-Speed Train Wheels Based on Vehicle-Mounted Vibration Sensor Data***
*Technical Paper Publication: JRC2022-79365*
*Haichuan Tang - CRRC Academy*
*Junyan Dai - Rutgers University*

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**Track 12-D: New Technologies**
4/21/2022
1:55PM–2:55PM - Room 3 - Tracks 3, 6, & 12

Chair: ***Mehdi Ahmadian – Virginia Tech***
Co-Chair: ***Milad Hosseinipour – IEEE***

***Deep Autoencoder for Ultrasound-Based Rail Flaw Detection***
*Technical Paper Publication: JRC2022-79554*
*Yuning Wu - University of Utah*
*Xuan Zhu - University of Utah*
*Jay Baillargeon - Federal Railroad Administration*

***Data Visualization Using Google Earth Engine Coupled With Unsupervised Learning: A Practical Approach to Detecting Track Instability***
*Technical Paper Publication: JRC2022-79557*
*Sayedmohammad Hosseini - Virginia Tech*
*Mehdi Ahmadian - Virginia Tech*
*Ahmad Radmehr - Virginia Tech*

***Design and Field Testing of an Energy Harvester Tie: Enabling Rail Safety and Connectivity***
*Technical Presentation Only: JRC2022-79565*
*Yu Pan - Virginia Tech*
*Mehdi Ahmadian - Virginia Tech*

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The ASME Rail Transportation Division is offering a limited number of conference scholarships for both undergraduates and graduate students. For specific details and questions regarding the scholarship program, please contact Dr. Mehdi Ahmadian, ASME RTD Scholarship Committee Chair, at asme.rtd.scholar@gmail.com.

## TRACKS

| |
|---|
| **1 - Railroad Infrastructure Engineering** |
| **2 - Rail Equipment Engineering** |
| **3 - Signal and Train Control Engineering** |
| **4 - Service Quality and Operations Research** |
| **5 - Planning and Development** |
| **6 - Safety and Security** |
| **7 - Energy Efficiency and Sustainability** |
| **8 - Urban Passenger Rail Transport** |
| **9 - Electrification** |
| **10 - Vehicle Track Interaction** |
| **11 - Railroad History** |
| **12- New Technologies** |

# We hope you enjoyed our second JRC Virtual Conference! Thank you for your participation and remember to JOIN US AGAIN IN 2023 in Baltimore, MD!

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