



ASME® 2021 Joint Rail Conference
RTD and JRC: 100 Years of Tracking
and Promoting Railroading Progress

CONFERENCE
April 20–21, 2021

Virtual, Online

Program

<https://event.asme.org/Joint-Rail-Conference>



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ASME[®] 2021 JRC

Welcome to the 100th anniversary of the Joint Rail Conference (JRC). While the centennial celebration was postponed in 2020, we are proud to offer a virtual conference in 2021.

The Rail Transportation Division (RTD) is one of the original eight American Society of Mechanical Engineers (ASME) Divisions founded in 1920 as the Railroad Division. The Division's original purpose was to promote art, science, and the practice of mechanical and multidisciplinary engineering and allied sciences to all modes of rail. It later became the Rail Transportation Division to reflect its broad focus on metro rail, as well as global freight and passenger rail. The first Joint Rail Conference in 1920 was a partnership between ASME and the Institute of Electrical and Electronic Engineers (IEEE). ASME is the lead organization for this year's conference. ASME has collaborated with IEEE, AREMA, and INFORM-RAS, uniting a diverse group of practitioners and researchers working in the field of railroad engineering.

The pandemic has presented unprecedented personal and professional challenges for everyone. Engineering has played a pivotal role to mitigate the diverse range of challenges and disruptions that have adversely affected us all. On-the-fly innovations have led to improved air purifying systems, studies on viral spread, advances in genetic engineering, and many other technical innovations, many at a stunningly rapid pace. The rail industry has encountered its own challenges and is dedicated to pursuing innovations and policies that assure the safety of those involved in the industry while also managing major reductions in ridership, revenue, and funding.

The JRC constantly strives to move constructively toward improvements as well as work cooperatively toward the identification of areas that need attention. We are eager to diagnose problems and effectively apply new or established concepts and techniques.

The railroad industry has provided us exciting and amazing experiences. We would like to encourage new generations to share those experiences by supporting students to attend the conference. To show our commitment, the RTD and some of our sponsors have dedicated funding for student support for attending the conference.

We welcome back the yearly JRC Grand Challenge Competition, which is open to all conference attendees. The registered participants are invited to propose an idea based on the Grand Challenge Question and present that idea to a panel of industry experts using a 10-minute presentation.

We are honored to have Theresa M. Impastato and Edward F. Boyle as invited speakers to our conference. They have accumulated more than 45 years in rail industry experience. Ms. Impastato is the EVP/Chief Safety officer for WMATA, and Mr. Boyle is the VP of Engineering at Norfolk Southern.

The members of the JRC organizing committee have poured blood, sweat, and tears into this conference. I thank the participating committee members for their contributions. We have over 95 presentations and a Data Science Workshop hosted by Alstom, which I am sure you will enjoy. Thank you for your support of the JRC, and all the best to you and yours during this time.

Giuseppe Sammartino
2020–2021 ASME RTD and JRC Chair
Principal Engineer and Group Director
CTL Group



Tribute to Samuel R. (Sam) Williams

The American Society of Mechanical Engineers - Rail Transportation Division (RTD) expresses profound appreciation for his service, as Samuel R. Williams retires as the Manager of Divisional Affairs. The RTD has been blessed to have Sam volunteering in this position for over 18 years.

His long-standing dedication and commitment to the RTD is no surprise when compared to his other life achievements. Sam provided 45 years of dedicated service as a Mechanical Engineer to The Timken Company, where he retired in 2003 as a Chief Engineer with the Global Railroad Bearing Business. His other commitment continues with his 58-year marriage to his loving wife, Connie; they currently reside in Dublin, Ohio.

While fulfilling the role Manager of Divisional Affairs at RTD, Sam displayed an absolute loyalty, strong personal commitment, and was relied upon to do the job of keeping the members of the division and committees on task. Sam consistently demonstrated high standards of professional conduct with a polite and calming demeanor.

We thank Sam for his contributions and guidance over the years and hope we can all borrow from his warm and genuine professional excellence. —**Giuseppe Sammartino, P.E., CTL Group and JRC Conference Chair**

Sam served the Joint Rail Conference and Rail Transportation Division as Manager of Divisional Affairs for 18 years. He has been a consummate professional, an integral part of our conference (keeping all the meeting minutes and lists), and a good friend. Any question I could not answer, I would look to Sam for help. His memory is unparalleled, and though he deserves to retire (Sam retired years ago from his Engineering job), I told him he could not! Needless to say, I lost that battle. He is leaving very big shoes to fill and will be sorely missed. Enjoy your retirement, Sam and please stay in touch! —**Mary Jakubowski, ASME Manager, Conferences & Events**

Sam Williams has been the stalwart of the Rail Transportation Division (RTD) for the past decade. He has worked diligently to keep volunteers like me in line with the tasks ahead of us. Additionally, he has brought the division his endless wisdom, with a grandfatherly deliverance, as only he can. We will tremendously miss Sam, as he is getting ready to step down and pass on his responsibilities to his successor, Steve Dedmon.

Sam, it has been a pleasure knowing you for more than 25 years and working with you during the past few years. We will miss your great service to the Division. Hopefully, this will leave you more time to spend time with Connie. I also hope that you will remain involved with the Division and we will have an opportunity to see you at our future events.-- **Mehdi Ahmadian, JRC Secretary & Student Support Chair**



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Sam has exemplified the best of character, personally and as an engineer. His intellect, imagination, and productive energy have been a strong contributor to progress and accomplishment during his career and service to ASME. —**Nick Darien, ASME 2002 Nominating Committee Acting Chair, 2007–2008 Rail Transportation Division Chair**

Sam first became an influence on me when we first met over 20 years ago. We spoke about bearings and joining the ASME Rail Transportation Division (RTD). I have tremendous respect for Sam with his absolutely remarkable career at Timken and his amazing volunteer service to the ASME RTD. He was always reliable to bring calm to our stormy waters. Thank you so much, Sam, and I wish the best to you and your family. —**Matthew G. Dick, P.E., ASME RTD Chair 2012–2013.**

During my time with the ASME RTD Board, Sam was the glue that held us all together. He managed meeting invites, kept items from falling through the cracks, maintained contact lists, provided perspective, and overall showed tremendous and sincere dedication to the mission of RTD, even through rough patches. Sam was always incredibly kind and patient with me as I attempted to balance careers, family, and RTD. Sam, I can't imagine RTD without you! Thank you for serving the rail research community for so long and I wish you the best for the future. —**Michelle Priante Muhlanger, Deputy Regional Administrator, Federal Transit Administration**

Sam Williams has been a dedicated and key member of the North American Railroad industry for decades. His many contributions to our industry, to the Timken Company and to ASME RTD will not be forgotten. A fine engineer, a fine man and a fine friend. I hope he enjoys retirement. —**Cameron Lonsdale, Member RTD Hist. & Heritage**

Sam has been a part of my "ASME" life for many years, and along with his wife, Connie, has made the many conferences my wife, Sandy, and I have attended so much more enjoyable. He helped guide me through the positions I have held. And I know he did the same for others. Sam was the glue that kept things together; he more than anyone else made the Rail Transportation Division what it is today. I deeply feel the loss of your leaving, Sam, but wish you and Connie the best in your retirement. —**Steve Dedmon, Standard Steel, Retired**

In addition to his amazing engineering career in the rail industry supply sector, Sam Williams' work supporting ASME and the Rail Transportation Division is commendable. His support and leadership for the RTD has lasted for decades. I have been privileged to have known Sam Williams for over 20 years. Sam was an incredible resource for me during my time as RTD Chairman in 2004, and in that era his steady guidance helped the RTD board to reinvigorate the Joint Rail Conference, improve conference attendance, and create the Terry Hawthorne Memorial Scholarship. I consider Sam a good friend and wish him well. —**David Cackovic, Retired AVP and Chief Technical Standards, TTCI/AAR**



GENERAL INFORMATION

REGISTRATION FEES

Full Conference Rates

ASME Member/Author: \$249

ASME Non-Member: \$299

Life Member: \$189

ASME Student Member: \$189

Student Non-Member: \$229

Registration Includes: OnDemand access to the virtual platform for 90 days after the conference, online access to all technical presentations, pre-recorded technical presentations, and live presentations (recorded and posted after the conference), and digital access to all online papers as well as the official conference proceedings.

Content Presented at ASME Conferences: Unless otherwise agreed to in a separate document, all copyright to abstracts/papers and live or recorded presentations made at the virtual conference will be the property of ASME, including translations, transcriptions, and third-party distribution rights worldwide without restriction in all current and future media. Participants are reminded to present information associated with approved papers and abstracts and not to present any information that may be considered proprietary, confidential, or restricted in any way.

Registration Fees: ALL conference participants must register and pay the advertised fee, including authors; presenters; chairs; co-chairs; topic and session organizers, sponsors, exhibitors, and general attendees. Non-member fees include a one-year complimentary membership to ASME.

Payment Method: Individuals with incomplete registrations will not be able to attend the conference until payment has been made and registration is completed. ASME accepts VISA, MasterCard, American Express, and Discover.

Presenter Substitution: Each abstract/paper has a primary author identified who is responsible to present the abstract/paper at the conference. Should the primary author not be available to present the paper, a co-author may be nominated to present the paper as a substitution. Any proposed substitution must be approved one week in advance by ASME Publications and the Event Management staff must be notified one week in advance of the presentation.

Refunds/Cancellation Fee: There will be no refunds for ASME Virtual Conference Registration.



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

Photographs/Video/Audio Recordings: Unless otherwise agreed to in a separate document, participants are reminded that material presented at ASME conferences is under copyright of ASME. As a result, “ANY recording of the presentations is prohibited.”

Limitation of Liability: You agree to release and hold harmless ASME from any and all claims, demands, and causes of action arising out of or relating to your participation in this event.

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.

MEMBERSHIP

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, Conferences & Events 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.



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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



2021 JRC SCHEDULE

Please Note: The Schedule-at-a-Glance can be found on the website under the Program page (https://event.asme.org/Events/media/library/resources/jrc/JRC-Program-at-a-glance-wp-drt_4-1-2021.pdf) with all presentation assignments. Detailed presentations can be found starting on page 28 of this program.

TUESDAY, APRIL 20

<u>Date</u>	<u>Event</u>	<u>Virtual Room</u>
9:00AM–11:00AM	Technical Workshop - Data Science in Transportation, Alstom	Room 2
11:00AM–11:10AM	Break	
11:10AM–12:10PM	Plenary Speaker, Edward F. Boyle, VP Engineering, NS	Room 1
12:10PM–12:20PM	Break	
12:20PM–1:20PM	Track 2A - Rail Equipment Engineering	Room 2
	Track 3 - Signal and Train Control	Room 3
1:20PM–1:30PM	Break	
1:30PM–2:35PM	Track 9 - Electrification	Room 1
	Track 5A - Planning and Development	Room 2
	Track 6A - Signal and Train Control Engineering	Room 3
2:35PM–2:45PM	Networking Break	
2:45PM–3:45PM	Track 1B - Railroad Infrastructure Engineering	Room 1
	Track 2B - Rail Equipment Engineering	Room 2
	Track 4 - Service Quality and Operations Research	Room 3
3:45PM–3:55PM	Break	
3:55PM–4:55PM	Track 1D - Railroad Infrastructure Engineering	Room 1
	Track 12A - New Technologies	Room 2
	Track 6B - Safety and Security	Room 3
4:55PM–5:15PM	Social Networking Event Sponsored by LRW	Room 1



2021 JRC SCHEDULE – CONT'D

WEDNESDAY, APRIL 21

<u>Date</u>	<u>Event</u>	<u>Virtual Room</u>
9:00AM–10:00AM	Keynote Speaker, Theresa Impastato, EVP, WMATA	Room 1
10:00AM–10:10AM	Break	
10:10AM–11:10AM	Track 6C - Safety and Security	Room 1
	Track 11 – Railroad History	Room 2
	Track 8 - Urban Passenger Rail Transport – Should be 12C?	Room 3
11:10AM–11:20AM	Break	
11:20AM–12:05PM	Track 5B - Planning and Development	Room 1
	Track 7 - Energy Efficiency and Sustainability	Room 2
12:05PM–12:15PM	Shift5 Live Presentation	Room 1
12:15 PM-12:35PM	Networking Break	
12:35PM–1:35PM	Track 10A - Vehicle Track Interaction	Room 1
	Track 6D - Safety and Security	Room 2
	Track 12B - New Technologies	Room 3
1:35PM–1:45PM	BREAK	
1:45PM–2:40PM	Track 10B - Vehicle Track Interaction	Room 1
	Track 1C - Railroad Infrastructure Engineering	Room 2
2:40PM–2:50PM	Break	
2:50PM–3:50PM	GRAND CHALLENGE	Room 1
3:50PM–4:00PM	Break	
4:00PM–4:45 PM	Track 10C - Vehicle Track Interaction	Room 1
	Track 12D - New Technologies	Room 3



WORKSHOP

Tuesday, April 20
9:00AM–11:00AM
Room 2

Data Science in Transportation

During this workshop, the Alstom data science team will provide their experiences on applying data science methods in the transportation industry, for different vital and non-vital applications. First, they will talk about a variety of topics such as data collection, cleaning, and mining, manual and automatic feature engineering and selection, and model building, evaluation, and tuning. Then, the Alstom data science team will share their thoughts on the pre-production approval of models and results with systems engineering, validation, safety, and software teams. Finally, model extensions for real industry-grade applications will be presented. Basic and advanced statistical and machine learning techniques, applicable for data mining, anomaly detection, inference, and prediction, will be demonstrated using python.

What will you learn?

- Exploratory data analysis
- Statistical data analysis
- Machine Learning techniques
- Feature engineering
- Basics of python language, including pandas and scikit-learn
- Models evaluation
- Model results presentation
- Models industrialization

Who is this workshop for?

- Technical managers to understand how statistical and machine learning techniques can help with challenging tasks in the transportation industry
- Software developers to learn statistical and machine learning methods that should be industrialized on the edge and cloud platforms



Prerequisites:

- A strong desire to learn about data science
- A moderate desire to go deep into math and stats
- Some programming knowledge (preferably python)

Sections

(1) Why use data science in transportation?	10 min
(2) Four key tasks for data scientists: describe, diagnose, predict, and prescribe	10 min
(3) Example applications in transportation	40 min
(4) Hands-on: Data science in action	40 min
(5) Final remarks	10 min
Q&A	10 min

About the Presenter:

Emilio Barcelos is the Product Manager for Alstom's Wayside Intelligence and Analytics Platform, which includes both hardware and software solutions for data-driven applications in the rail industry. Previously, he was the Innovation Data Science Leader for Alstom in North America, directing the design and implementation of end-to-end smart data and artificial intelligence applications in collaboration with Alstom experts in various development centers worldwide.

Before joining Alstom, Emilio held positions in the energy, food, and technology industries and worked in academia as a professor and researcher. He has a Ph.D. in the area of computer vision and infrared thermography and an MBA. Emilio is also a frequent speaker at leading events and reviewer for high-impact journals.



PLENARY SPEAKER

Tuesday, April 20
10:30AM–11:30AM
Room 1



Edward F. Boyle

Ed Boyle is the Vice President, Engineering for the Norfolk Southern Railway. He is responsible for the design, construction, inspection, and maintenance of railroad infrastructure, including track, bridges, and vehicle fleet. Boyle joined the company in 1994 as an engineering management trainee. He has held positions of increasing responsibility in both the engineering and transportation departments. Since May 2019, he has served in the Engineering Department as Vice President, Engineering.

KEYNOTE

Wednesday, April 21

9:00AM–9:45AM

Room 1



Theresa M. Impastato

Theresa Impastato is currently the EVP/Chief Safety Officer for WMATA. She, who holds a B.S. and M.Sc. from the University of Oxford and a B.S. from UPenn, has served in many capacities to improve the safety of railroading. She was the lead for the team at Amtrak which developed and submitted the first SSPP to the FRA, in advance of regulatory requirements. She has served as an industry leader in the RSAC, APTA, and TRB. Impastato has 20 years in the industry.



JRC STUDENT SUPPORT

The American Society of Mechanical Engineers (ASME) Rail Transportation Division (RTD) and IEEE Vehicular Technology Society continue to be strong supporters of collegiate researchers, both professors and students, who play a vital role in the advancement of the rail industry. To this end, we will continue to offer Graduate and Undergraduate Student Support to students enrolled in Mechanical Engineering or Electrical and Computer Engineering programs in North America. The support provides students the opportunity to network with rail professionals, present rail research publications, and exchange ideas on rail technological innovations and solutions at the Joint Rail Conference (JRC). Most importantly, the support increases awareness of the rail engineering discipline from both an academic and professional perspective.

ASME RTD Graduate Student Conference Support

V. Terrey Hawthorne Memorial Student Support Fund

Purpose: Provide funding toward conference registration for the 2021 JRC Virtual Conference on April 20–21, 2021. The awardees will be receiving a full reimbursement of their student registration fee for the entire conference. Strong preference will be given to the students who have submitted a paper for publication and/or presentation at the conference. Additional preference will be given to the presenting students.

Award Amount: Reimbursement of Student Registration Fee

[Graduate Student Support Application Form](#)

Requirements:

- The student must be enrolled full-time in a Mechanical Engineering or Electrical and Computer Engineering program and attending a U.S. college or university.
- Student recipients must commit to attending the online sessions of the conference. Failure to comply with this requirement will result in forfeiture of the student support.
- The student must complete and return the ASMERTD Graduate Student Support application to ASME.RTD.Scholar@gmail.com by the deadline specified above (March 12, 2021)
- Upon review of the applications by the RTD Student Support Committee, the applicants will be notified by email by April 5, 2021. The decision of the Committee is final and is not subject to appeal.

Upon their selection, the students will be automatically registered for the conference and receive a notification from ASME.

Please note that additional student support details and requirements may apply.



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ASME RTD Undergraduate Student Conference Support

Swamidas K. Charan (John) Punwani Memorial Undergraduate Student Support Fund

Purpose: To provide funding toward conference registration expenses for student support awardees selected to attend the 2021 ASME Joint Rail Conference.

Award Amount: Reimbursement of Student Registration Fee

Undergraduate Student Support Application Form

Requirements:

- The student must be enrolled full-time in an undergraduate Mechanical Engineering or Electrical Engineering program and attending a U.S. college, technical college, or university.
- The student must be of Junior or Senior status.
- *The student must submit an essay (minimum 250 words, maximum 400 words) that addresses the "challenge" question listed below:*

We have been witnessing increasingly rapid advances in the rail industry during the past 100 years. What would you expect railroading to look like in order to remain competitive and economically, socially, and environmentally relevant in light of the rapid technological evolutions, social and economic changes, and even pandemics such as COVID-19?

Please cite your references and limit your usage of graphics to a maximum of two (2). The graphics do not count toward the word limit.

Note: *If you are an undergraduate student who has submitted a technical paper to the conference, you are not required to submit an essay, but you are required to submit the undergraduate application to be considered for the undergraduate student support.*

- Student recipients must commit to attending the online sessions of the conference. Failure to comply with this requirement will result in forfeiture of the student support.
- The student must complete and return the ASME RTD Undergraduate Student Support application and essay (if applicable) to ASME.RTD.Scholar@gmail.com by the deadline specified.



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- Upon review of the applications by the RTD Student Support Committee, the applicants will be notified by email by April 5, 2021. The successful applicants will receive an email notification from the ASME RTD Student Support Committee indicating their selection. The decision of the Committee is final and is not subject to appeal.

Upon their selection, the students will be automatically registered for the conference and receive a notification from ASME.

Please note that additional student support details and requirements may apply.

Questions regarding the ASME RTD Graduate and/or Undergraduate Student Support programs should be directed to Prof. Mehdi Ahmadian, ASME RTD Student Support Committee Chair, at ASME.RTD.Scholar@gmail.com.

For inquiries regarding student support disbursements, please contact ASME Staff Support, Mary D. Jakubowski at jakubowskim@asme.org.



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JRC 2021 GRAND CHALLENGE

Tuesday, April 20

2:50PM-3:50PM

Room 1

Purpose: To spark new ideas, innovations, and approaches to solving a relevant issue affecting the railroad industry.

Award Amount: \$500. The competition winner will also be announced after the conference and recognized by ASME.

Open to: All Registered Participants

How to Attend: All Registered attendees will be able to attend the Virtual Grand Challenge.

Presentations: April 21, 2:35PM–3:35PM

For questions: Please contact the JRC Organizing Committee: [Milad Hosseinipour](#).

This year the JRC will host the 4th Annual JRC Grand Challenge Competition open to all conference attendees. We invite registered participants to propose an idea to the Grand Challenge Question below and present that idea to a panel of industry experts using a 10-minute presentation.

There are multiple pillars of science and technology that run the railroads. They include, but are not limit to, Mechanical Engineering, Electrical Engineering, Civil Engineering, and Computer Science. This year, the JRC grand challenge is looking for novel ideas that cross boundaries between one or multiple areas. Examples are Mechatronics, Robotics, Automation, Drones, Data Science, and Artificial Intelligence. These innovative ideas are the cutting edge of changing the status quo in safety, business intelligence, resiliency, green energy, operations, efficiency, and ride quality. The JRC 2021 Grand Challenge asks all researchers and attendees to submit their idea around the topic below.

We have been witnessing increasingly rapid advances in the rail industry during the past 100 years. What would you expect railroading to look like in order to remain competitive and economically, socially, and environmentally relevant in light of the rapid technological evolutions, social and economic changes, and even pandemics such as COVID-19?

The forum is open to ideas that the presenter is working on or believes has enough relevance to the current and future state of railroads. However, attendees should be mindful of the limitations of these technologies within the railroads. For example, implementing a reliable and accurate AI model to provide tangible results for improving PTC requires a significant amount of data. Without access to useful data, the AI model would suffer from poor performance and generality. One should first propose a platform for gathering the required data to train the models.



ACKNOWLEDGMENTS

ORGANIZING COMMITTEE

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Giuseppe Sammartino (ASME)
Principal Engineer & Group Director
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Director, Railway Technologies Laboratory

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Sam Williams – Retiring in 2021*

*Steve Dedmon will assume this position after the 2021 Conference.



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2020–2021 JRC CO-CHAIRS ORGANIZING AND PLANNING COMMITTEE

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*Steve Dedmon will assume this position after the 2021 Conference.



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CO-CHAIR:

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APTA

CO-CHAIR:

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American Public Transportation Association

AREMA

CO-CHAIR:

Lindsay McNichols



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ASME RAIL TRANSPORTATION DIVISION COMMITTEE MEMBERS JULY 1, 2019 THROUGH JUNE 30, 2021 (two-year term)

EXECUTIVE COMMITTEE (6)

Chair: Giuseppe Sammartino
Secretary & Student
Support Chair: Mehdi Ahmadian
Technical Program Chair: Dave Schlesinger
Asst. Tech. Program Chair: Milad Hosseinipour
Publicity Chair: Ronald Golembiewski
Mgr. of Divisional Affairs: Sam Williams

ADVISORY COMMITTEE (5)

Bryan Schlake - Chair (year 2)
Jeff Gordon - (year 3), Student Support
Committee
Bob Irving - (year 4)
Steve Dedmon - (year 6)

AC HONORARY MEMBERS (5)

Gerald Anderson
Dave Cackovic
Nick Darien
Cameron Lonsdale - Member RTD Hist. & Heritage

GENERAL COMMITTEE-AT LARGE (24+Chair)

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Dan Blasko - Asst. Chair Publicity
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Li Cheng
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Tom Guins - Newsletter Editor
Yunbo Hou
Jessica Iacobucci - Progress Rpts. Chair Pass. &
Transit
Mike Iden - Chair RTD History & Heritage
Scott Keegan
Yan Liu
Timothy Mast - Progress Rpts. Chair Locomotives
Corey Pasta
Shaun Richmond - Prog. Rpts. Chair Freight Cars
Devin Rouse
Sergey Sandler
Tom Schlueter
Xinggao Shu
Monique Stewart
Gary Wolf

REV. 03/02/2021 SRW

ASME STAFF SUPPORT

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Email: leel@asme.org or
toolboxhelp@asme.org



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Email: zlatnikb@asme.org

EXECUTIVE COMMITTEE (6)

EC – RTD CHAIR & CHAIR GENERAL RR-2 & EXECUTIVE RR-1 COMMITTEES

Giuseppe Sammartino (06/16) [2019–20]
Principal Engineer & Group Director
CTL Group
Structural & Transportation Laboratory
Skokie, IL

EC – SECRETARY & CHAIR STUDENT SUPPORT

Mehdi Ahmadian
Director, Center for Vehicle Systems and Safety
Director Railway Technologies Laboratory
Virginia Tech, MC-0901
Blacksburg, VA

EC – MGR. OF DIVISIONAL AFFAIRS

Samuel R. Williams (2003)
Dublin, OH

EC – CHAIR TECHNICAL PROGRAM RR-4

Dave Schlesinger (06/16)
Senior Technical Consultant
Parsons
Centreville, VA

EC – ASST. CHAIR TECH. PROG. RR-4

Milad Hosseinipour (07/08)
Director of Data and Analytics Product Engineering
Product Design, IEEE
Piscataway, NJ

EC – CHAIR PUBLICITY

Ronald Golembiewski (01/17)
Sr. Project Engineer
Standard Car Truck
Rosemont, IL



ADVISORY COMMITTEE (5)

AC – CHAIR (YEAR 2)

Bryan Schlake (10/12) [2018–19]
Instructor of Rail Transportation Engineering
Engineering Academic Adviser
Penn State Altoona
Altoona, PA

AC – MEMBER (YEAR 3)

MEMBER STUDENT SUPPORT RR-11

Jeffrey Gordon (08/12) [2016–18]
U.S. Department of Transportation
Federal Railroad Administration
Cambridge, MA

AC – ADVISORY RR-3 (YEAR 4)

Robert Irving (07/09) [2015–16]
Kelso Technologies (USA), Inc.
Staff Engineer
Bonham, TX

AC – MEMBER (YEAR 5)

Michelle Muhlanger (01/11) [2014–15]
Deputy Regional Administrator
Federal Transit Administration, Region 1
U.S. Department of Transportation

AC – MEMBER (YEAR 6)

Steven L. Dedmon (07/08) [2013–14]
Retired - Standard Steel, LLC
McClure PA

ADVISORY COMMITTEE - HONORARY (4)

ACH – MEMBER

Gerald B. Anderson [2009–10]
Oro Valley, AZ

ACH – MEMBER

David L. Cackovic (2010) [2004–05]
Retired – TTCI
Pueblo West, CO

ACH – MEMBER

Nicholas J. Darien (12/13) [2007–08]
Darian, IL

ACH – MEMBER RTD HISTORY & HERITAGE RR-10

Cameron P. Lonsdale [2008–09]
Vice President – Sales
Standard Steel
Burnham, PA



GENERAL COMMITTEE (24)

GC – MEMBER

Leila Aboharb (07/15)
Manager of Mechanical Systems at CLASSE
Cornel University
Ithaca, NY

GC – ASST. CHAIR PUBLICITY RR-8

Dan Blasko (05/19)
Rail Engineering Specialist
The Timken Company
North Canton, OH

GC – MEMBER: HISTORY & HERITAGE RR-10

Michael L. Burshtin (11/12)
Retired - Amtrak
Richland, NJ

GC – MEMBER

Li Cheng (07/07)
President
International Railway Technology, LLC.
Dublin, OH

GC – MEMBER: TECH. PROGRAM COMMITTEE

Scott Cummings (01/17)
Transportation Technology Center, Inc.
Pueblo, CO

GC – MEMBER

Brian Dick (03/14)
Product Engineer
Amsted Rail
Overland Park, KS

GC – MEMBER: TECH. PROGRAM COMMITTEE RR-4

Brian Donohue (05/13)
WSP USA
Broomfield, CO

GC – ASST. CHAIR STUDENT SUPPORT

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Director – Process & Industrial Engineering
Standard Steel, LLC
Burnham, PA

GC – MEMBER

Emanuele Grossi (09/20)
Engineering Consultant
Exponent
Chicago, IL

GC – NEWSLETTER EDITOR RR-8

Thomas S. Guins
3403 Morris Ave
Pueblo, CO

GC – MEMBER

Yunbo Hou (06/20)
Validation Engineer
Alstom North America
Missouri City, TX

GC – PROGRESS REPORTS RR-5: CHAIR PASSENGER AND TRANSIT

Jessica Iacobucci (05/19)
LTK Engineering
Ambler, PA



GENERAL COMMITTEE (24) – CONT'D

GC – PROGRESS REPORTS, CHAIR

LOCOMOTIVES

Timothy Mast (06/20)
Research Engineer
Center for Vehicle Systems & Safety (CVeSS)
Railway Technologies Lab (RTL)
Virginia Tech
Blacksburg, VA

GC – MEMBER

Corey Pasta (07/09)
Director, Train Dynamics
BNSF Railway Company
Topeka, KS

GC – PROGRESS REPORTS RR-5:

CHAIR FREIGHT CARS

Shaun Richmond (02/17)
Retired - Trinity Rail
Frankfurt, IL

GC – MEMBER

Devin Rouse (07/09)
Federal Railroad Administration
U.S. Department of Transportation
Washington, DC

GC – MEMBER

Sergey Sandler (09/19)
Tooling & Equipment Engineer
TTX Company
Chicago, IL

GC – MEMBER

Tom Schlueter (07/09)
Engineering Director
Progress Rail
A Caterpillar Company
Fort Worth, TX

GC – MEMBER

Xinggao Shu (12/13)
Principal Investigator I1
Transportation Technology Center, Inc.
Pueblo, CO

GC – CHAIR HISTORY & HERITAGE RR-10:

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Kildeer, IL

GC – MEMBER

Lincoln Scott Keegan (12/13)
Manager, Operations Engineering
Norfolk Southern Corp.
Atlanta, GA

GC – MEMBER

Yan Liu (07/09)
Team Leader, Vehicle Simulation, Rail
Automotive & Surface Transportation
National Research Council Canada (NRC)
Ottawa, ON, Canada

GC – MEMBER

Monique Stewart
Program Manager
Office of Research and Development
Federal Railroad Administration
Washington, DC

GC – MEMBER

Gary Wolf
President
Wolf Railway Consulting, LLC
Avondale Estates, GA



TECHNICAL PRESENTATIONS

TUESDAY, APRIL 20

4/20/2021

12:20PM to 1:20PM - Room 2

Chair: **Jeffrey Gordon, Federal Railroad Administration**

Co-Chair: **Bryan Schlake - Penn State Altoona**

New Locomotives & Technologies: Reducing Operating & Market Failures Through Use of Aggressive Reliability Growth Testing (RGT)

Technical Paper Publication: JRC2021-58360

Michael Iden - Tier 5 Locomotive LLC

Tom Kennedy - Kennedy Rail Consulting LLC

Crash Energy Management Design for the LACMTA Hr4000 Heavy Rail Vehicle

2020 Presentation: JRC2021-58443

Anbo Wang - LTK Engineering

Yanwen Liu - CRRC Changchun

Xiaofang Liu - CRRC MA

Steven W. Kirkpatrick - ARA

Virginia Phan - ARA

Robert T. Bocchieri - ARA

Estimating the Inner Ring Defect Size and Residual Service Life of Freight Railcar Bearings Using Vibration Signatures

2020 Presentation: JRC2021-58423

Jennifer Lima - University of Texas Rio Grande Valley

Constantine Tarawneh - University of Texas Rio Grande Valley

Jesse Aguilera - University of Texas Rio Grande Valley

Jonas Cuanang - University of Texas Rio Grande Valley

Updated Fuel Tank Puncture Survey, 1995-2020

Technical Paper Publication: JRC2021-58520

Karina Jacobsen - USDOT-Volpe Ctr



4/20/2021

12:20PM to 1:20PM - Room 3

Chair: **David Thurston – Canadian Pacific Railway**

Access Point Placement Optimization for a CBTC System Wireless Data Communication Network

2020 Presentation: JRC2021-58289

Arash Aziminejad - WSP

Yan He - WSP Canada

The Next Generation of Train Control for Canadian Heavy Haul Systems

2020 Presentation: JRC2021-58467

David Thurston – Canadian Pacific Railway

1:30PM to 2:35PM - Room 1

Chair: **John Grantham - Atkins**

Co-Chair: **Bih-Yuan Ku - National Taipei University of Technology**

OCS Rehabilitation and Kevlar Contact Wire Fall Prevention-VTA San Jose, CA

Technical Paper Publication: JRC2021-58229

Paul White - HNTB Corporation

Gerti Kola - HNTB Corporation

Ashraf Siddiq - Santa Clara Valley Transportation Authority

Alan Ng - HDR Incorporated

Optimal Positioning of Wayside Energy Storage Systems in Local Transport Networks

Technical Paper Publication: JRC2021-58018

Philip Otto - Karlsruhe Institute of Technology

Peter Gratzfeld - Karlsruhe Institute of Technology

The Adoption of Aluminum Stainless Steel Conductor Technology in North America

Technical Paper Publication: JRC2021-58498

Keith Forman - Conductix, Inc.



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Analysis of 3rd Rail Condition and Performance With a Data Acquisition Suite

Technical Paper Publication: JRC2021-58512

Trevor Howe - Conductix-Wampfler

Ryan Frost - Conductix-Wampfler

Keith Forman - Conductix-Wampfler

4/20/2021

1:30PM to 2:35PM - Room 2

Chair: ***Jeffrey Gordon, Federal Railroad Administration***

Configuration Management: It Is Time to Get Into the Game!

Technical Presentation Only: JRC2021-67907

Brian Donohue - WSP USA

Departure Status Prediction From Railyards Using Machine Learning Algorithms

Technical Presentation Only: JRC2021-58392

Niloofer Minbashi - KTH Royal Institute of Technology

Markus Bohlin - KTH Royal Institute of Technology

Carl-William Palmqvist - Lund University

Behzad Kordnejad - KTH Royal Institute of Technology

Network Centrality and Long-Term Investment Decisions for Railroad Networks

Technical Presentation Only: JRC2021-66702

Pierre Carriere - Western New England University

Myungseob Kim - Western New England University

Paul Schonfeld - University of Maryland, College Park

Fei Wu - University of Maryland, College Park



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4/20/2021

1:30PM to 2:35PM - Room 3

Chair: **Dave Schlesinger - Parsons**

Topological Analytics for Vulnerability and Recovery Enhancements After Disruption of Rail Networks

Technical Presentation Only: JRC2021-66833

Sici Cao - University of Maryland, College Park

Bilal Ayyub - University of Maryland, College Park

Yalda Saadat - University of Maryland, College Park

Magdy Elsibaie - University of Maryland, College Park

Tarek Omar - Office of Research and Development, Federal Railroad Administration

Optimized Sequencing of Post-Disaster Restoration Alternatives for Freight Railroad Networks

Technical Presentation Only: JRC2021-66836

Paul Schonfeld - University of Maryland

Fei Wu - University of Maryland

Myungseob (Edward) Kim - Western New England University

An Optimization Method for Integrating Short-Term Post-Disruption Restoration and Long-Term Improvement of Freight Railroad Networks

Technical Presentation Only: JRC2021-66838

Paul Schonfeld - University of Maryland

Fei Wu - University of Maryland

Myungseob (Edward) Kim - Western New England University

4/20/2021

2:45PM to 3:45PM - Room 1

Chair: **Debakanta (Deb) Mishra - Oklahoma State University**

Study of Prestressed Concrete Prisms Using a Parallel Computing Algorithm

2020 Presentation: JRC2021-58300

Moochul Shin - Western New England University

Abdoulaye Diallo - Western New England University

Changhoon Lee - Western New England University



Field Investigation of Broken Cut Spikes on Elastic Fasteners Using Instrumented Spikes at Fast

2020 Presentation: JRC2021-58518

Yin Gao - Transportation Technology Center

Mike Mchenry - Transportation Technology Center, Inc.

Megan Brice - Transportation Technology Center, Inc.

Jay Baillargeon - Federal Railroad Administration

Effect of Longitudinal Fastener Stiffness and Fastening System Loading

Technical Paper Publication: JRC2021-58496

Christian Khachaturian - University of Illinois at Urbana-Champaign

Marcus Dersch - University of Illinois at Urbana-Champaign

J. Riley Edwards - University of Illinois at Urbana-Champaign

Matheus Trizotto - University of Illinois at Urbana-Champaign

Laboratory and Numerical Investigations on the Performance of Flowable Soil as a Sustainable Backfill for Railway Bridge Transition

Technical Presentation Only: JRC2021-58366

Tack-Woo Lee - Korea Railroad Network Authority

Tri Le - Kunsan National University

Dae-Wook Park - Kunsan National University

Jung-Woo Seo - Kunsan National University

Stabilization of Railroad Ballast Using Polyurethane Under Various Coal Fouling Conditions

Technical Paper Publication: JRC2021-58396

Dinesh Gundavaram - Indian Institute of Technology Patna

Hussaini Syed Khaja Karimullah - Indian Institute of Technology Patna



4/20/2021

2:45PM to 3:45PM - Room 2

Chair: **Jeffrey Gordon, Federal Railroad Administration**

Co-Chair: **Bryan Schlake - Penn State Altoona**

An Evaluation of Passenger Mass Effects in Crashworthiness Analyses of Heavy Rail Vehicles

2020 Presentation: JRC2021-58526

Steven Kirkpatrick - Applied Research Associates, Inc.

Robert T. Bocchieri - ARA Inc.

Alexander Zeigle - Applied Research Associates, Inc.

Xiaofang Liu - CRRC MA Corporation

Anbo Wang - CRRC MA Corporation

Liu Yanwen - CRRC - Changchun Railway Vehicles Co.

Railclad™ for Welding Aluminum-to-Steel in Train Carbody Structures

2020 Presentation: JRC2021-65749

David Gauthier - NobelClad

Edgar Vidal - NobelClad

Haley Reiersgord - NobelClad

Progress in Railway Mechanical Engineering - 2019-2020 Survey - Locomotives

Technical Paper Publication: JRC2021-58425

Timothy Mast - Virginia Tech

Influence of Coupler Features in Longitudinal Ride Comfort Evaluation of Railway Vehicles Equipped With Centre Buffer Couplers

Technical Presentation Only: JRC2021-68527

Om Prakash Yadav - Indian Institute of Technology Kanpur

Nalinaksh S. Vyas - Indian Institute of Technology Kanpur

Locomotive Crash Energy Management Vehicle-to-Vehicle Impact Test Results

2020 Presentation: JRC2021-58244

Patricia Llana - USDOT Volpe Center

Karina Jacobsen - USDOT Volpe Center

Richard Stringfellow - CAMX Power



4/20/2021

2:45PM to 3:45PM - Room 3

Chair: **Clark Cheng - Norfolk Southern Railway**

Co-Chair: **Rapik Saat - Association of American Railways**

A Mini-Network Simulation Approach to Investigate the Capacity and Safety Aspects of National Rail Network

Technical Paper Publication: JRC2021-58525

Hamed Pouryousef - Sharma & Associates, Inc.

Monique Stewart - FRA

Som Singh - Sharma & Associates, Inc.

Anand Prabhakaran - Sharma & Associates, Inc.

Reliability & Maintainability Strategies for Repairable Systems in a Mass Transit Rolling Stock Subway

Technical Paper Publication: JRC2021-57999

Aercio Regis Alencar - Toronto Transit Commission

Estimation of Pre-Covid19 Daily Ridership Patterns From Paper and Electronic Ticket Sales Data With Origin-Destination, Time-of-Day, and Train-Start Detail on a Commuter Railroad: Quick-Response Big Data Analytics in a World Steeped With Tradition

Technical Paper Publication: JRC2021-59109

Alex Lu - Metro-North Commuter Railroad

Thomas Marchwinski - Metro-North Commuter Railroad

Robert Culhane - Metropolitan Transportation Authority Finance

Xiaojing Wei - Metropolitan Transportation Authority Construction & Development

Scheduling Maintenance Technicians in a Railway Depot

Technical Paper Publication: JRC2021-60425

Tiago Alves - IDMEC, Instituto Superior Técnico, Universidade de Lisboa

Antonio R. Andrade - IDMEC, Instituto Superior Técnico, Universidade de Lisboa



4/20/2021

3:55PM to 4:55PM - Room 1

Chair: ***Debakanta (Deb) Mishra - Oklahoma State University***

A Review of Parameters Effecting Rail Break Gap Size Using Analytical Methods

Technical Paper Publication: JRC2021-58511

Matheus Trizotto - RailTEC

Max Potvin - RailTEC

Marcus Dersch - RailTEC

J. Riley Edwards - RailTEC

Arthur De Oliveira Lima - RailTEC

Considerations for Sensor Selection for Detecting Top-of-Rail (TOR) Lubrication

2020 Presentation: JRC2021-58349

Timothy Mast - Virginia Tech

Campbell Neighborgall - Virginia Tech

Masood Taheri - Virginia Tech

Carvel Holton - Virginia Tech

Mehdi Ahmadian - Virginia Tech

Development of Predictive Analytics Using Autonomous Track Geometry Measurement System Data

2020 Presentation: JRC2021-58014

Jay Baillargeon - Federal Railroad Administration

Daniel Einbinder - ENSCO, Inc.

Radim Bruzek - ENSCO, Inc.

Intermediate Distance Testing of Optical TOR Lubricity Sensors on a Remote-Controlled Rail Cart

Technical Paper Publication: JRC2021-58347

Timothy Mast - Virginia Tech

Yu Pan - Virginia Tech

Carvel Holton - Virginia Tech

Mehdi Ahmadian - Virginia Tech



4/20/2021

3:55PM to 4:55PM - Room 2

Chair: **Mehdi Ahmadian - VA Poly Inst & State Univ**

Co-Chair: **Milad Hosseinipour - IEEE**

Rail Neutral Temperature Estimation Using Field Data, Numerical Models, and Machine Learning

Technical Paper Publication: JRC2021-58324

Yuning Wu - University of Utah

Xuan Zhu - University of Utah

Chi-Luen Huang - University of Illinois at Urbana-Champaign

Sangmin Lee - University of Illinois at Urbana-Champaign

Marcus Dersch - University of Illinois at Urbana-Champaign

John Popovics - University of Illinois at Urbana-Champaign

Advanced Enterprise Asset Management Systems: Improve Predictive Maintenance and Asset Performance by Leveraging Industry 4.0 and the Internet of Things (IoT)

Technical Paper Publication: JRC2021-58346

Sravani Tadanki - Parsons Corporation

Sandeep Bhanji - Parsons Corporation

Howard Shotz - Parsons Corporation

Patrick Warren - Berger- Levrault Canadatd

Youssef Miloudi - CARL Berger-Levrault

A Data-Driven Framework for Railroad Crossing Property Status: Evaluation, Design Diagnosis, and Prediction

Technical Presentation Only: JRC2021-58524

Emilio Barcelos - Alstom Signaling Operations LLC

Zengyan Wang - Alstom Signaling Operations LLC

Mahdi Seyednezhad - Alstom Signaling Operations LLC

Hector Rojas - Alstom Signaling Operations LLC

Nenad Mijatovic - Alstom Signaling Operations LLC

Conditions Influencing Mudslides as Seen Through Radar Coherence Images

Technical Presentation Only: JRC2021-58531

Sumanth Byrraju - U of SC

Dimitris Rizos - University of South Carolina



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Design and Bench Tests of a Smart Railroad Tie for Energy Harvesting

2020 Presentation: JRC2021-58329

Yu Pan - Virginia Tech

Lei Zuo - Virginia Tech

Mehdi Ahmadian - Virginia Tech

4/20/2021

3:55PM to 4:55PM - Room 3

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

An Evaluation of Derailment Mechanics and Derailment Analysis Methodologies

Technical Paper Publication: JRC2021-58527

Steven Kirkpatrick - Applied Research Associates, Inc.

Characterizing the Performance of Tank Car Pressure Relief Devices Under Derailment Fire Conditions: Flammable Fuel Tests

Technical Presentation Only: JRC2021-58515

Anand Prabhakaran - Sharma & Associates, Inc.

Francisco Gonzalez, III - Federal Railroad Administration

Graydon Booth - Sharma & Associates, Inc.

Frank Otremba - BAM

Effect of Tank Car Placement on Hazardous Material Train Accident Severity

Technical Presentation Only: JRC2021-58740

Chen-Yu Lin - University of Illinois at Urbana-Champaign

Jaemin Kim - University of Illinois at Urbana-Champaign

Xinhao Liu - University of Illinois at Urbana-Champaign

Christopher Barkan - University of Illinois at Urbana-Champaign

Railway and Transit Hazard Resolution Challenges

Technical Presentation Only: JRC2021-58225

Amin Kalbasi - Parsons Inc.

Raking Impact of a Diesel Multiple Unit Fuel Tank: Tests and Analysis

2020 Presentation: JRC2021-58419

Karina Jacobsen - USDOT-Volpe Ctr, Michael Carolan, USDOT-Volpe Ctr



WEDNESDAY, APRIL 21

4/21/2021

10:10AM to 11:10AM - Room 1

Chair: **Dave Schlesinger - Parsons**

Secondary Impact Protection for Locomotive Engineers: Improved Bag Design

Technical Paper Publication: JRC2021-58523

Florentina Gantoi - Sharma & Associates, Inc.

Jeffrey Gordon - Federal Railroad Administration

Anand Prabhakaran - Sharma & Associates, Inc.

Som Singh - Sharma & Associates, Inc.

Transportation Resilience Models for Supply Chain Analysis Using Complex Network Theory (CNT)

Technical Presentation Only: JRC2021-66825

Yalda Saadat - University of Maryland, College Park

Bilal Ayyub - University of Maryland, College Park

Jennifer Helgeson - National Institute of Standards and Technology

Sally Saleem - University of Maryland, College Park

Keeping Cyber Security on Track

Technical Presentation Only: JRC2021-58756

Dave Schlesinger - Parsons

Ethan Schlesinger - Parsons

4/21/2021

10:10AM to 11:10AM - Room 2

Chair: **Michael Iden - Tier 5 Locomotive LLC**

Co-Chair: **Timothy Mast - Wabtec**

Going Off the Rails: Exploring the Impact of the Railroad on the Development of Musical Culture in Kansas City, Missouri (1869—1905)

Technical Presentation Only: JRC2021-58399

Gabriella Roderer - University of Missouri-Kansas City



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A North American Historical Review of Three-Axle Freight Trucks

2020 Presentation: JRC2021-58463

William Shust - Objective Engineers Inc.

Michael M. Palmieri - Retired

2019 Nominations for ASME Historic Mechanical Engineering Landmark Status, Rail Transportation Category

2020 Presentation: JRC2021-58327

Michael Iden - Tier 5 Locomotive LLC

American Railroad Freight Cars: 100 Years of Progress — 1920 to 2020

2020 Presentation: JRC2021-60508

Shaun Richmond - Trinity Rail

Current and Voltage Choice for North American Railroad Electrifications: 1895-1931

2020 Presentation: JRC2021-59946

John Allen - Independent Consultant

4/21/2021

10:10AM to 11:10AM - Room 3

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

Monorail Technology Review – A Medium Capacity Transit Solution for Space Constrained Urban Environments - A Technical and Operational Review

Technical Paper Publication: JRC2021-58382

Fabio Barbosa - FCB Research

Multimodal Mobility Framework: Seamless Mobility Experience

Technical Paper Publication: JRC2021-58377

Jian Sun - Hitachi Rail

Ravigopal Vennelakanti - Hitachi America Ltd. R&D

Malarvizhi Sankaranarayananasamy - Hitachi America Ltd. R&D

Ramyar Saeedi - Hitachi America Ltd. R&D

Rahul Vishwakarma - Hitachi America Ltd. R&D

Prasun Singh - Hitachi America Ltd. R&D

Yushi Akiyama - Hitachi America Ltd.

Hisao Adachi - Hitachi America Ltd.



4/21/2021

11:20AM to 12:05PM - Room 1

Chair: **Jeffrey Gordon, Federal Railroad Administration**

Weights and Their Consideration in Topological Analysis of Rail Networks

Technical Presentation Only: JRC2021-66790

Majed A. Hamed - Center for Technology and Systems Management

Bilal M. Ayyub - Center for Technology and Systems Management

Magdy Elsibaie - Center for Technology and Systems Management

Yujie Mao - Center for Technology and Systems Management

Yalda Saadat - Center for Technology and Systems Management

Tarek Omar - Office of Research and Development, Federal Railroad Administration

Optimizing Topology of Rail Networks: The Case of Reclassing, Acquisition and Repurposing of Tracks

Technical Presentation Only: JRC2021-66820

Yujie Mao - Center for Technology and Systems Management

Bilal M. Ayyub - Center for Technology and Systems Management

Magdy Elsibaie - Center for Technology and Systems Management

Yalda Saadat - Center for Technology and Systems Management

Tarek Omar - Office of Research and Development, Federal Railroad Administration

Fractals and Rail Network Topology: Renormalization for Their Identification and Characterization

Technical Presentation Only: JRC2021-66845

Donald Dzedzy - University of Maryland

Yujie Mao - University of Maryland

Bilal Ayyub - University of Maryland

4/21/2021

11:20AM to 12:05PM - Room 2

Chair: **Brian Donohue - WSP USA**

Hybrid Rail Technology Review an Intermediate Pathway for Electrifying the Freight and Passenger Commuter Rail Sector

Technical Paper Publication: JRC2021-58271

Fabio Barbosa - FCB Research



Battery Electric Locomotives and Battery Tenders: Operational and Infrastructure Challenges to Widespread Adoption

Technical Paper Publication: JRC2021-58378

Michael Iden - Tier 5 Locomotive LLC

Energy Harvesting Device for Powering Onboard Condition Monitoring Modules in Rail Service

Technical Paper Publication: JRC2021-58326

Martin Amaro - University of Texas Rio Grande Valley

Constantine Tarawneh - University of Texas-Pan American

Heinrich Foltz - University of Texas Rio Grande Valley

Roberto Garcia - University of Texas Rio Grande Valley

Optimizing Power Consumption of Freight Railroad Bearings Using Laboratory Experimental Data

2020 Presentation: JRC2021-58424

Carlos Lopez III - University of Texas Rio Grande Valley

Constantine Tarawneh - University of Texas Rio Grande Valley

Arturo Fuentes - University of Texas Rio Grande Valley

Harry Siegal - University of Texas Rio Grande Valley

4/21/2021

12:35PM to 1:35PM - Room 1

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

Co-Chair: ***Jeffrey Gordon, Federal Railroad Administration***

An Experimental Study of the Influence of the Amount of Top-of-Rail Friction Modifiers on Traction

Technical Paper Publication: JRC2021-58433

Yu Pan - Virginia Tech

Ahmad Radmehr - Virginia Tech

Mehdi Ahmadian - Virginia Tech

Ali Tajaddini - Federal Railroad Administration



A Statistical Approach to Evaluating Wheel-Rail Contact Dynamics

Technical Paper Publication: JRC2021-58381

*Sayedmohammad Hosseini - Virginia Polytechnic Institute and State University
Arash Hosseinian Ahangarnejad - Virginia Polytechnic Institute and State University
Ahmad Radmehr - Virginia Polytechnic Institute and State University
Ali Tajaddini - Federal Railroad Administration Office of Research, Development,
and Technology
Mehdi Ahmadian - Virginia Polytechnic Institute and State University*

Development of a New Approach Measuring the Wheel/Rail Interaction Loads

Technical Paper Publication: JRC2021-58471

*Rustam Rahimov - Emperor Alexander I St. Petersburg State Transport University
Waa'il Lafta - Griffith University
Yuriy Boronenko - Emperor Alexander I St. Petersburg State Transport University*

Modelling the Effect of Track Stiffness Variation on Wheel Rail Interaction Using Finite Element Method

Technical Paper Publication: JRC2021-58519

*Lovejoy Mutswatiwa - Addis Ababa University
Celestin Nkundineza - Addis Ababa University
Mehmet Guler - American University of the Middle East*

4/21/2021

12:35PM to 1:35PM - Room 2

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

Safety Integrity Level (Sil) Allocation on Monorail Rolling Stock

Technical Paper Publication: JRC2021-58223

James Li - Parsons

Benchmarking Railroad Safety Performance Between the United States and the United Kingdom

Technical Presentation Only: JRC2021-58773

*Chen-Yu Lin - University of Illinois at Urbana-Champaign
Theodore Gerstein - University of Illinois at Urbana-Champaign
Christopher Barkan - University of Illinois at Urbana-Champaign*



ASME® 2021 JRC

Institutional Memory, Training, and Organizational Safety Culture

Technical Presentation Only: JRC2021-58753

Dave Schlesinger - Parsons

Improving Highway-Rail Safety at Cognitively Complex Intersections: Examining the Impact of Short-Storage Crossings on Driver Decision Behavior and Incident Outcome

Technical Presentation Only: JRC2021-58418

Elizabeth Veinott - Michigan Technological University

Anne Linja - Michigan Technological University

David Nelson - Michigan Technological University

Pasi Lautala - Michigan Technological University

Raking Impact and Analysis of a Diesel Multiple Unit Fuel Tank

Technical Paper Publication: JRC2021-58421

Karina Jacobsen - USDOT-Volpe Ctr

Michael Carolan, USDOT-Volpe Ctr

4/21/2021

12:35PM to 1:35PM - Room 3

Chair: ***Mehdi Ahmadian - VA Poly Inst & State Univ***

Co-Chair: ***Milad Hosseinipour - IEEE***

Performance Evaluation of a Novel Optical Sensing System for Detecting Rail Lubricity Conditions

Technical Paper Publication: JRC2021-58435

Yu Pan - Virginia Tech

Timothy Mast - Virginia Tech

Carvel Holton - Virginia Tech

Mehdi Ahmadian - Virginia Tech

Forward-Looking Infrared Radiometry (FLIR) Application for Detecting Ballast Fouling

2020 Presentation: JRC2021-58291

SayedMohammad Hosseini - Virginia Polytechnic Institute and State University

Yongwen Tan - Virginia Polytechnic Institute and State University

Mehdi Ahmadian - Virginia Polytechnic Institute and State University

Balance Velocity of Wheelset and Hunting Eliminator

Technical Presentation Only: JRC2021-58245

Jack Huang - High Tech Pressure Safety



4/21/2021

1:45PM to 2:40PM - Room 1

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

Co-Chair: **Jeffrey Gordon, Federal Railroad Administration**

Investigating the Influence of Angle of Attack (Yaw) on Wheel-Rail Interface (WRI) Dynamics

2020 Presentation: JRC2021-58363

Ahmad Radmehr - Virginia Tech

Arash Hosseinian Ahangarnejad - Virginia Tech

Ali Tajaddini - Federal Railroad Administration

Mehdi Ahmadian - Virginia Tech

Wheel-Rail Contact Patch Geometry Measurement and Shape Analysis Under Various Loading Conditions

2020 Presentation: JRC2021-58364

Ahmad Radmehr - Virginia Tech

Arash Hosseinian Ahangarnejad - Virginia Tech

Yu Pan - Virginia Tech

Sayedmohammad Hosseini - Virginia Tech

Ali Tajaddini - Federal Railroad Administration

Mehdi Ahmadian - Virginia Tech

Thermal Effects on Wheel Performance Based on Twin Disc Testing

2020 Presentation: JRC2021-58494

Ding Qing Li - TTCI

Monique Stewart - Federal Railroad Administration

A Computationally Efficient Algorithm for Simulating the Dynamic Train-Track Interaction

2020 Presentation: JRC2021-58406

Arya Datta - University of South Carolina

Dimitris Rizos - University of South Carolina

Yu Qian - University of South Carolina

Robert Mullen - University of South Carolina



4/21/2021

1:45PM to 2:40PM - Room 2

Chair: **Debakanta (Deb) Mishra - Oklahoma State University**

Development of Deep Convoluted Neural Networks (DCNNS) and Change Detection Technology for Improved Railway Track Inspection

Technical Presentation Only: JRC2021-58483

Ryan Harrington - University of Illinois at Urbana Champaign

John Edwards - University of Illinois at Urbana Champaign

Richard Fox-Ivey - Railmetrics

Arthur De Oliveira Lima - University of Illinois at Urbana Champaign

John Laurent - Railmetrics

Prioritization of Focus Areas - Wireless Continuous Monitoring of Track Condition and Stress State Exception Reporting

Technical Presentation Only: JRC2021-58486

Ian Germoglio Barbosa - University of Illinois Urbana-Champaign

John Riley Edwards - University of Illinois at Urbana-Champaign

Arthur De Oliveira Lima - University of Illinois at Urbana-Champaign

Marcus Scott Dersch - University of Illinois at Urbana-Champaign

Josue Cesar Bastos - University of Illinois at Urbana-Champaign

An IoT Proposal to Monitor and Maintain Rail Infrastructure

Technical Presentation Only: JRC2021-64776

Antonio Lugara - Hitachi Vantara

A Systems Approach for the Evaluation and Rebuilding of the Rogers Pass Systems on Canadian Pacific

Technical Paper Publication: JRC2021-58468

David Thurston - Canadian Pacific Railway



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4/21/2021

4:00PM to 4:55PM - Room 1

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

Co-Chair: **Jeffrey Gordon, Federal Railroad Administration**

Multiscale Simulation Based Mixed Train Derailment Analysis: A Case Study

Technical Paper Publication: JRC2021-58311

Yi Wang - Canadian Pacific Railway/Simon Fraser University

Kyle Mulligan - Canadian Pacific Railway

Steven Nich - Canadian Pacific Railway

Kevin Oldknow - Simon Fraser University

G. Gary Wang - Simon Fraser University

Railroad Forces During Curve Negotiations and Definition of the Balance Speed

Technical Presentation Only: JRC2021-60378

Hao Ling - University of Illinois at Chicago

Ahmed A. Shabana - University of Illinois at Chicago

Surface Profile and Third-Body Layer Accumulation Measurement Using a 3d Laser Profiler

2020 Presentation: JRC2021-58361

Ahmad Radmehr - Virginia Tech

Arash Hosseinian Ahangarnejad - Virginia Tech

Ali Tajaddini - Federal Railroad Administration

Mehdi Ahmadian - Virginia Tech

4/21/2021

4:00PM to 4:55PM - Room 3

Chair: **Mehdi Ahmadian - VA Poly Inst & State Univ**

Co-Chair: **Milad Hosseinipour - IEEE**

Coefficients of Friction---Static Versus Dynamic

2020 Presentation: JRC2021-58314

Jack Huang - High Tech Pressure Safety



ASME® 2021 JRC

Optimization of Railroad Bearing Health Monitoring System for Wireless Utilization

2020 Presentation: JRC2021-58417

Jonas Cuanang - University of Texas Rio Grande Valley

Constantine Tarawneh - University of Texas Rio Grande Valley

Martin Amaro - University of Texas Rio Grande Valley

Jennifer Lima - University of Texas Rio Grande Valley

Heinrich Foltz - University of Texas Rio Grande Valley

A Field Demonstration Study of Using Off-the-Shelf Sensors to Monitor Rail Tank Cars Carrying Dangerous Goods

2020 Presentation: JRC2021-62280

Chris Ladubec - National Research Council Canada

Chengbi Dai - National Research Council Canada

Yan Liu - National Research Council Canada

Isabelle Roy - Transport Canada, Transportation of Dangerous Goods

Railroad Freight Car Remote Controlled Electrically Driven Set and Release Hand Brake (EDHB) – Optimization for Increased Reliability and Performance

2020 Presentation: JRC2021-58522

David Brabb - Sharma & Associates, Inc.

Anand Prabhakaran - Sharma & Associates, Inc.

Monique Stewart - Federal Railroad Administration



TRACK CHAIRS

Railroad Infrastructure Engineering

Chair: Debakanta Mishra, *Oklahoma State University*

Rail Equipment Engineering

Chair: Jeff Gordon, Federal Railroad Administration
Co-chair: Bryan Schlake, *Penn State Altoona*

Signal and Train Control Engineering

Chair: Dave Thurston, *Canadian Pacific Railway*

Service Quality and Operations Research

Chair: Clark Cheng, *Norfolk Southern Railway*
Co-chair: Rapik Saat, *Association of American Railroads*

Planning and Development

Chair: Jeff Gordon, Federal Railroad Administration

Safety and Security

Chair: Dave Schlesinger, *Parsons*

Energy Efficiency and Sustainability

Chair: Brian Donohue, *WSP*

Urban Passenger Rail Transport

Chair: Brian Donohue, *WSP*

Electrification

Chair: John Grantham, *Atkins*
Co-chair: Bih-Yuan Ku, *National Taipei University of Technology*

Vehicle Track Interaction

Chair: Anand Prabhakaran, *Sharma & Associates, Inc.*
Co-chair: Jeff Gordon, Federal Railroad Administration

Railroad History

Chair: Michael Iden, *Tier 5 Locomotive LLC*
Co-chair: Timothy Mast, *Virginal Tech*

New Technologies

Chair: Mehdi Ahmadian, *Virginia Polytechnic Institute and State University*
Co-chair: Milad Hosseinipour, *IEEE*

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Join us on Wednesday at 12:05PM – Room 1 for a 10-minute Live Presentation!



Based in Washington, DC, Shift5 is a transportation data company whose customers run smarter, safer, and more efficiently by unlocking their fleet's data. Fleets generate massive amounts of data every day, and fleet owners deserve technology solutions that generate real business value. Collectively, Shift5 has spent decades living and breathing heavy vehicle data. The founders were among the first members of the US Army Cyber Command where they were charged with keeping heavy ground vehicles and military aircraft safe from cyber attacks. During their service, they discovered that many of these platforms share the same internal components and serial communications networks as today's passenger and freight locomotives. With this extensive background in hand, the Shift5 team has built a product that is currently being utilized in the defense market and has begun deployment into Class 1 freight and commuter rail companies. The Shift5 solution today integrates directly onto existing locomotive and powered car platforms, collecting and enriching data from all electronic components, and presenting live-view analytics into custom dashboards. This enables Shift5 customers to employ this data to automate menial tasks, improve reliability and safety, and make smarter business decisions. Visit us at <https://www.shift5.io/>.

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Founded in 1997, the League of Railway Women (LRW) is committed to connecting and cultivating women in rail, thereby promoting diversity and improving the business results of the railroad industry. Our mission is to advance the representation, recognition, and opportunities for women in the railroad industry by providing networking opportunities, sponsoring industry educational activities, and supporting mentoring partnerships. Learn more at www.railwaywomen.org.



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Go to: <https://event.asme.org/Joint-Rail-Conference>

Abstracts are limited to a maximum of 400 words. Paper submittal is encouraged but not required. Interested authors will be notified of abstract acceptance, and conference papers will be peer-reviewed. ***Publication of papers in conference proceedings requires attendance and presentation at the conference please.***

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

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



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our first JRC Virtual
Conference! Thank you
for your participation
and remember to
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2022!**