



AMERICAN RAILWAY ENGINEERING AND
MAINTENANCE-OF-WAY ASSOCIATION

2024 Call for Papers “Trending Topics”

Communications, Signals & Information Technology

- Next Generation Train Control Systems
- The impact of new technologies on Railroads, highlighting concerns to be shared with other industries
- The importance of scales (impacts of inaccurate weight)
- Education on the considerations and assumptions made in Onboard Braking Curves
- A railroad or vendor project that solves a challenge
- On-board Movement Authority with Virtual Block
- Alternatives for Crossing Monitoring Systems
- Future of Overloaded Car Protection
- Surge Protection for Signal Equipment
- Controlled & Automated Vehicle (CAV) Standard Development and Design Considerations for Grade Crossing
- Maintenance of way (MOW) Equipment integration with positive train control (PTC)
- CTC/ITCM
- Wheel-rail interface for track circuits
- Alternative applications for PTC (e.g. not IETMS – ACSES, ATC, IITC)

Engineering Services

- Minimize track outages in inspection, maintenance, and construction
- Legal aspects to Environmental regulatory permitting trends
- Locomotive technology – alternative fuel sources
- Locomotive technology – system changes to operating infrastructure and maintenance
- Recruiting and Retention
- Railway infrastructure life-cycle cost analysis
- Sustainability/resiliency
- Security response planning
- Precision Scheduled Railroad (PSR Influences on Engineering: Yard and Facility Consolidations)
- Operating Expense Reduction – What can you stop doing?
- Leveraging the economic benefits of Positive Train Control (PTC)
- Terminal capacity and its integration with line capacity
- Short lines and Federal Railroad Administration (FRA) 243 Title 49 Part 243 of the code of Federal Regulations (CFR)
- General electrification of the freight railroad system and its possible impacts
- Life cycle emissions analysis of railroad infrastructure projects
- Incorporate post Covid project implementation with regards to supply chain
- Hiring of 3rd parties (outsourcing)
- Digital delivery
- Emerging technologies related to railroad operations

Maintenance-of-Way

- Autonomous technology for maintenance of way equipment
 - Detection of Roadway Workers

- Advancements Autonomous testing technology
- Data driven maintenance planning
- Drainage System Designs/Sub-Grade Stability Repair
- OSHA vs. FRA safety considerations (changes with Crane Safety between agencies)
- Autonomous Inspection – Drone-based, vision-based, etc.
 - Artificial Intelligence Advancements
- 213 Track Inspection changes – RSAC, FRA etc. changes to sub-part F; Waivers on inspection technology; ATI
- Training Track Inspectors – Latest technology, best practices - virtual training techniques
- Machine/Equipment automation – Testing and what the future looks like from a Class I perspective
- Vegetation Detection and Control – New Technologies
- Tamping equipment guidelines and new technologies
- ATGMS/Hy-Rail based geometry systems
- Ground Penetrating Radar
- Gauge Repeatability and Reproducibility studies on Track Geometry data
- Advancements in Battery tool technology
- Technology advancements in RWP and RMM operation
- Collision Avoidance Technology

Passenger & Transit

- Project Delivery/Lessons Learned
- Electrification Systems
- Service Improvements and Enhancements in a Complex or Existing Railroad Environment
- Planning, Design, and Political Considerations for New Start or Line Extension Projects
- Vehicle Technologies/Fleet Management
- Service Planning – Operational Modeling
- Developments in Asset Management/Maintenance Planning
- Three-Dimensional Modeling and Use of Data for Maintenance and Construction
- Project Dashboards – Scope, Schedule, Outages, Planning the Work
- Railroad Coordination for Agencies
- Unveiling the Mystery of the STB
- Resiliency Planning for Passenger Systems
- Facility Considerations for Changing Passenger Operations

Structures

- Environmental and Climate Considerations for bridge design, construction, and rehabilitation
- Cyber Security for Movable Bridges
- Sustainability
 - Material
 - Life Span
- Materials technology and innovation
- Hard core lessons learned (tell us how you face planted and recovered to complete the project)
- Fire Protection for Structures
- Data Collection for Asset Management
 - Innovation in Capital Planning
 - Inspection Resources
 - Innovation in Monitoring
- Resiliency – what are we doing today to be relevant tomorrow? Emergency event response could factor.
- AAR/MxV topics, current University research topics
- High performance concrete, modernization of concrete materials, timber materials, etc.

Track

- Reduction of Track Occupancy for Testing & Maintenance
- Rolling contact fatigue (RCF)
- Current Installation practices & methods for utility crossings
- Sustainable tie technology
- Actual project/maintenance examples
- New roadway machine technology
- Lessons learned with leveraging public funding for railroad improvements (procurement & execution)
- Strategies to reduce or eliminate track and infrastructure caused derailments
- Practical sustainability strategies