



AMERICAN RAILWAY ENGINEERING AND
MAINTENANCE-OF-WAY ASSOCIATION

2023 Call for Papers “Hot 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 (PSRU Influences on Engineering: Yard and Facility Consolidations and Operating Expense Reduction – What can you stop doing?)
- Leveraging the economic benefits of Positive Train Control (PTC)
- Big data analytics
- 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)
- Environmental regulatory permitting trends
- General electrification of the freight railroad system and its possible impacts
- Life cycle emissions analysis of railroad infrastructure projects

Maintenance-of-Way

- Autonomous technology for maintenance of way equipment
- Autonomous testing technology advancements
- 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.
- 213 Track Inspection changes – RSAC, FRA etc. changes to sub-part F; Waivers on inspection technology
- 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 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 roadway worker protection (RWP) and remote monitoring & management (RMM) operation
- Collision Avoidance Technology

Passenger & Transit

- Alternative Project Delivery Methods
- 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
- New Vehicle Technologies
- New Corridor Planning Process – Operational Modeling
- Precision Scheduled Railroading / Freight Scheduling in relation to Passenger Service
- Asset Management / Maintenance Planning
- Three-Dimensional Modelling and Use of Data
- Project Dashboards – Scope, Schedule, Outages, Planning the Work
- Lessons Learned

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

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