



AMERICAN RAILWAY ENGINEERING AND
MAINTENANCE-OF-WAY ASSOCIATION

2022 Call for Papers “Hot Topics”

Communications, Signals & Information Technology

- 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
- MOW Equipment integration with PTC
- CTC/ITCM
- Wheel-rail interface for track circuits
- Alternative applications for PTC (e.g. not IETMS – ACSES, ATC, IITC)

Engineering Services

- Sustainability / resiliency
- How to keep a railroad running under pandemic conditions
- Security response planning
- Precision Scheduled Railroad (PSRU Influences on Engineering: Yard and Facility Consolidations and Operating Expense Reduction – What can you stop doing?
- Terminal Capacity
- Leveraging the economic benefits of Positive Train Control (PTC)
- Use of Unmanned Aerial (UA) data for railroad applications
- 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
- How rail industry has permanently changed in responding to the pandemic (pos/neg)
- Locomotive Technology – system changes to operating, infrastructure and maintenance
- General electrification of the freight railroad system and its possible impacts
- Life cycle emissions analysis of railroad infrastructure projects
- Dealing with Intermodal volumes surges

Maintenance-of-Way

- Autonomous technology for maintenance of way equipment
- Next generation turnout and frog design
- Autonomous testing technology

- Data driven maintenance planning
- Drainage System Designs/Sub-Grade Stability Repair
- OSHA vs. FRA safety considerations
- Autonomous Inspection – Drone-based, vision-based etc.
- 213 Track Inspection changes – RSAC, FRA etc. changes to sub-part F
- Training Track Inspectors – Latest technology, best practices - virtual training
- 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

Passenger & Transit

- Program delivery and use alternative delivery on large programs
- Planning and environmental (NEPA) considerations for both New Start or Line Extension Projects
- Electrification issues such as On and Off-Wire Technology; conversions from AC/DC systems to other technologies; New Vehicle technologies using batteries.
- Asset Management or Condition Assessments and how technology is being applied by field forces
- Mini-High Level Platforms coordination and approach to design and construction
- ADA Platforms and introduction into existing rail systems
- Stray Current issues and solutions
- Shared Use Corridor Engineering Issues
- Use of LiDAR in Transit/Rail Corridors and Underground Systems
- Use of BIM and project collaboration.
- Use of Dashboards to track/monitor projects and share information with stakeholders and the public
- Intermodal or Multi-modal rail projects
- How Technology and Software can manage large programs for the railroads/agencies

Structures

- Cyber Security for Movable Bridges
- Sustainability
- Unmanned Aerial Vehicles for inspection, construction monitoring, post event analysis - focus on sensor capabilities
- Materials technology and innovation
- Construction technology and innovation
- Carbon Fiber Reinforcing
- Bridge strike detection prevention/protection and response
- New coating technologies
- Hard core lessons learned (tell us how you face planted and recovered to complete the project)
- Fire Protection for Structures

Track

- Improving the performance of track systems and components to enhance track safety, reduce track occupancy requirements for maintenance activities, and reduce life-cycle costs
- Addressing the design, construction and maintenance challenges of special trackwork
- Presenting research results, designs and methodologies to improve rail integrity (Topics could include research related to rolling contact fatigue (RCF), rail grinding, rail corrosion, or rail material and manufacturing improvements)
- Effective methods to improve track support in track transition areas and areas of weak subgrades

- Track designs that mitigate noise and vibration in urban environments
- Focused reports of Track Functional Group committee activities (e.g. important changes to the MRE, student involvement and outreach, etc.)
- Research updates from TTCI and universities on specific track related research projects
- Experiences from Class 1 freight, passenger and transit systems on the construction and maintenance of track, such as innovative work methodologies, the successful application of new technologies or the use of new materials
- Track related innovations from the international railway community with potential for use in North American railways
- Updates on Modern Tools to Assess Track Health & Inspection
 - Improve Reliability
 - Autonomy
 - Measure Everything
- New tie technology (extending service life of wood or concrete, new work on composites?)
- Continuous or non-contact rail testing, efficiencies in testing
- Cross Tie Alternatives: Extending service life of wood or concrete, new work on composites
- Theme: More focus on practical railroading, less focus on extremely technical topics