



AMERICAN RAILWAY ENGINEERING AND
MAINTENANCE-OF-WAY ASSOCIATION

2021 Call for Papers “Hot Topics”

Communications & Signals

- 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
- CTC over Interoperable Train Control Messaging (ITCM) development and implementation

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

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

- Infrastructure Bills or Investments
- Transit and Project Funding
- Program Delivery
- 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
- Stray Current issues and solutions
- Station Snow Removal –Maintenance issues and solutions [Heated platform technology (Radiant, geothermal, electrical)]
- Agency FTA audit preparation
- Shared Use Corridors
- Use of LiDAR in Transit Corridors and Underground systems
- Screen-shared virtual conferences for BIM walkthroughs and project collaboration.
- Use of Dashboards to track/monitor projects and share information with stakeholders and the public
- Communication Based Train Control (CBTC) ...
- Operations and Maintenance Facilities
- Intermodal or Multi-modal rail projects
- Grant Funding to leverage Federal dollars
- How Technology and Software can manage large programs for the railroads

Structures

- Scour
- Sustainability
- Effects of hydraulic events and techniques for mitigation
- Process for moving High Wide Heavy loads
- Unmanned Aerial Vehicles for inspection, construction monitoring, post event analysis - focus on sensor capabilities
- Materials technology and innovation
- Bridge strike detection prevention/protection and response
- Post event foundation analysis
- Remote operation of moveable bridges
- Corrosion on steel bridges
- New coating technologies
- Training for delivering consistent inspections
- Training for making repairs that solve the root cause
- Onboard detection for bridge assessment
- Hard core lessons learned

Track

- Improving the performance of track systems and components to enhance track safety 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