



# 2021 Virtual International Crosstie & Fastening System Symposium

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19 May 2021 - 16 June 2021  
Program



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# 2021 Symposium Sponsors



ONE STEP AHEAD.

# Welcome

The 2021 Virtual International Crosstie & Fastening System Symposium program will include more than 25 pre-recorded presentations that will be provided free of charge to attendees. Recordings of technical presentations will be released by topic area over a 5-week period for viewing throughout the remainder of 2021.

# Instructions

**Subscribe here** to receive email announcements.

Presentation recordings and slides will be published on their scheduled Wednesday at:

<https://crosstie.railtec.illinois.edu/virtual/>

# Overview

## Track Inspection Advancements and Applications

19 May 2021 | Sponsored by  **EVERTRAK**


## Concrete Crosstie Design and Performance

26 May 2021 | Sponsored by **Progress Rail**  
A Caterpillar Company


## Resilient Materials and Crosstie Support

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## Composite and Interspersed Crossties

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## Fastening System Design and Performance

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# Track Inspection Advancements and Applications

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# **EVERTRAK™**

## **Next Generation Imaging for Crosstie Inspection**

*Antonio Mauricio & Jeb Belcher – Loram Technologies, Inc.*

## **Use of Laser Triangulation and Deep Neural Networks (DNNs) for Railway Track Safety Inspections**

*Richard Fox-Ivey – Railmetrics*

*Ryan Harrington – University of Illinois Urbana-Champaign*

## **Holland Track Testing Fastening System Inspection and the Role of GRMS in Geometry Analysis**

*Russ Newberg & Sabri Cakdi – Holland*

## **Intelligent Railroad Track Components Inspection**

*Yu Qian & Feng Guo – University of South Carolina*

## **Advancing GRMS Technology by Assessing Emerging Failures**

*Hugh Thompson – Federal Railroad Administration (FRA)*

*Ted Sussmann – Volpe National Transportation Systems Center*

*Radim Bruzek – ENSCO*

***Presentations  
Available Here  
19 May 2021***



## **Using Available Technologies to Select the Prestressing Wire Indent Characteristics to Meet the Unique Requirements of Pretensioned Concrete Railroad Ties**

*Bob Peterman – Kansas State University*

*Steve Mattson – voestalpine Nortrak*

## **Implementing DIC Technologies in Performance Assessment and Quality Control of Concrete Ties**

*Dimitris Rizos – University of South Carolina*

## **The Effect of Water Flow in Cracks of Pretensioned Concrete Beams under Cyclic Loading**

*Josué Bastos – Technicontrol*

## **Development of an ASTM Standard for Measurement of Key Indented Reinforcement Characteristics**

*Terry Beck – Kansas State University*

## **Adaptive Prestressing System for Concrete Crossties using Shape Memory Alloys**

*Minsoo Sung & Bassem Andrawes – University of Illinois Urbana-Champaign*

***Presentations  
Available Here  
26 May 2021***

# Resilient Materials and Crosstie Support

2 June 2021 | Sponsored by Union Pacific Railroad



## **BUILDING AMERICA<sup>®</sup>**

### **BNSF Experience with Resilient Materials and Track Support**

*Erik Frohberg – BNSF Railway*

*Arthur Lima – University of Illinois Urbana-Champaign*

### **Quantification of the Effect of Train Type on Concrete Sleeper Ballast Pressure using a Support Condition Back-Calculator**

*Riley Edwards – University of Illinois Urbana-Champaign*

### **Quantifying Support Conditions underneath Railroad Ties using the Differential Shear Strain Approach**

*Deb Mishra – Oklahoma State University*

### **Development and Use of Tests on Under Tie Pads in Regards to the European Standard**

*Veronika Kollmeier – Technical University of Munich (TUM)*

### **Track Geometry Errors Caused by Convex Turnout Cross ties**

*Riku Varis & Tommi Rantala – Tampere University*

### **Effects of Mixed Traffic Patterns and Ballast Support Conditions on Track Performance Investigated through Discrete Element Modeling**

*Erol Tutumluer, Zhongyi Liu & Bin Feng – University of Illinois Urbana-Champaign*

### **The Use of Under Sleeper Pads and Under Ballast Mat to Improve the Performance of Railway Transition Zones**

*Melina Clara Scasserra, Carlos Aprile, Pablo Cocordano, Pablo Tanaro & Nicolas Beradi – Trenes Argentinos Infraestructura*

***Presentations Available Here***

***2 June 2021***

# Composite and Interspersed Crossties

9 June 2021 | Sponsored by Pandrol



**PANDROL**  
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## **Union Pacific Composite Tie Strategies**

*Rachel Beck – Union Pacific Railroad*

## **Field Assessment of Engineered Interspersed Concrete Crossties in Commuter Rail Ballasted Track**

*Jaiek Lee & Arthur Lima – University of Illinois Urbana-Champaign*

## **Nonlinear Structural Analysis of Recycled Polymer Composite Crossties under Flexural and In-situ Loading Applications using Finite Element Analysis**

*David Jack & Daniel Pulipati – Baylor University*

## **Evaluation of Use Concrete, Steel and Composite Crossties Interspersed with Wooden Crossties in a Brazilian General Freight Corridor**

*Patrick Macedo – VLI*

## **A New Track Homologation Methodolgy - Polymeric Crossties Approach**

*Aldo Machado & R. Vargas – Braskem*

*A. Merheb – MRS Logística S/A*

***Presentations  
Available Here  
9 June 2021***



*North America*

## **Effect of Fastening System Components on Spike Load Transfer**

*Christian Khachaturian & Marcus Dersch – University of Illinois Urbana-Champaign*

## **Investigation of Rail Load Distribution: from Wheel Load to Spike Load**

*Shushu Liu – Volpe National Transportation Systems Center*

## **Automated Broken Spike Detection Using Ultrasonic Testing**

*Yin Gao & Anish Poudel – Transportation Technology Center, Inc. (TTCI)*

*Cameron Stuart – Federal Railroad Administration (FRA)*

## **Direct Fixation Track: History and Development**

*Sheen Fong – LB Foster*

*Matt Gibbs – Chicago Transit Authority (CTA)*

## **Test and Verification Methods of Rail Fastening Systems Applied in Japan**

*Tadashi Deshimaru – Railway Technical Research Institute*

## **Direct Fixation Track Fastening System Design – Field Loading Demands and Behavior, and Anchorage Structural Capacity**

*Arthur Lima – University of Illinois Urbana-Champaign*

***Presentations  
Available Here  
16 June 2021***



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