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Dear 2022 Symposium Attendee,

Welcome to Champaign-Urbana, Illinois and the Department of Civil and Environmental Engineering (CEE) at the University of Illinois at Urbana-Champaign (Illinois). CEE at Illinois is home to the Rail Transportation and Engineering Center (RailTEC), and we look forward to you meeting the students, staff, and faculty that work within RailTEC and CEE.

We are pleased that you have chosen to attend the 2022 International Crosstie and Fastening System Symposium and hope you will actively participate in discussions and engage your fellow attendees throughout the event. Our objective is to facilitate the transfer of technology and knowledge as well as to further domestic and international communication and collaboration on the design and performance challenges and solutions for crossties and fastening systems. We are hopeful that you will enjoy the technical presentations, research discussions, Rail Transit and Class I keynote addresses, and your time in and around Champaign-Urbana.

We would like to thank the Federal Railroad Administration (FRA), Federal Transit Administration (FTA), BNSF Railway, voestalpine Nortrak, and Vossloh for their ongoing sponsorship of rail infrastructure research in RailTEC at Illinois. Without these organizations and the many other individuals and organizations that frequently provide input and guidance for our research we would not be able to conduct research and host an event such as this.

It is wonderful to be back meeting in person, and we are hopeful we can make up for lost time through fruitful interactions over the next few days. If there is anything that our team can do to make your stay in Champaign more enjoyable, please do not hesitate to contact one of the faculty, staff, or students within RailTEC. Have a wonderful week!

Sincerely,

Marcus S. Dersch  J. Riley Edwards  Arthur de Oliveira Lima

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2022 Symposium Welcome

RailTEC Infrastructure Research Sponsors

U.S. Department of Transportation
Federal Railroad Administration

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2022 Symposium Overview

**Tuesday 24 May**
Registration (Yeh Center Atrium, 1st Floor)  7:00am - 5:30pm
Light Breakfast  7:00am - 8:00am
Opening Remarks  8:00am - 8:20am
Technical Session 1  8:20am - 10:00am
Break  10:00am - 10:20am
Technical Session 2  10:20am - 12:00pm
Lunch (ECE Building, Room 3002)  12:00am - 1:30pm

**Rail Transit Keynote Address:** Robert Powers - Bay Area Rapid Transit (BART)

**BART: Keeping The Bay Area Moving**
Technical Session 3  1:30pm - 3:10pm
Break  3:10pm - 3:50pm
Technical Session 4  3:50pm - 5:30pm
Dinner (Memorial Stadium)  6:00pm - 8:00pm

**Wednesday 25 May**
Registration (Yeh Center Atrium, 1st Floor)  7:00am - 12:30pm
Light Breakfast  7:00am - 8:00am
Technical Session 5  8:00am - 9:30am
Break  9:30am - 9:50am
Technical Session 6  9:50am - 12:00pm
Lunch (ECE Building, Room 3002)  12:00pm - 1:30pm

**Class I Railroad Keynote Address:** John Cech - BNSF Railway

**Engineering a Resilient Supply Chain**
Technical Session 7  1:30pm - 3:30pm
Break  3:30pm - 3:50pm
Technical Session 8  3:50pm - 5:00pm

**Symposium Locations**

**Newmark Civil Engineering Laboratory**
Yeh Center - All Technical Sessions will be held in 1310 Yeh Center.

**Electrical and Computer Engineering (ECE) Building**
306 N. Wright St., Urbana, IL 61801

**Memorial Stadium**
1401 S. 1st St., Champaign, IL 61820

**Engineering Hall Patio**
1308 W. Green St., Urbana, IL 61801 (North side of building)
Tuesday Spoken Presentations

8:20  Session 1 - Concrete Crosstie Prestressing Research

Properties of Larger-Diameter Prestressing Wires and Their Use in Pretensioned Concrete Railroad Ties
  Bob Peterman - Kansas State University

Prototype Development of Concrete Crossties with Adaptive Prestressing System
  Bassem Andrawes - University of Illinois Urbana-Champaign

Structural Behavior of Polymer Concrete Crossties Prestressed With Basalt FRP Bars Tested as Per AREMA Testing Standards
  Mohsen Issa - University of Illinois at Chicago

10:00  Break

10:20  Session 2 - Concrete Crosstie Performance and Materials

Florida East Coast Railway and Brightline: Utilizing Historic Track Infrastructure to Offer Premier Freight and Passenger Rail Service for the Future
  Tom Roadcap - Brightline
  David Wenrich - Florida East Coast Railway

Theoretical Optimization of Track Stiffness Transitions with Interspersed Concrete Crossties
  Ricardo Quiros - voestalpine Railway Systems Nortrak
  Jaeik Lee - University of Illinois Urbana-Champaign

Development of High Performance Concrete Using Non-steel fiber for Prestressed Concrete Crossties
  Moochul Shin - Western New England University

A Decade of Progress: A Review of Recent Concrete Crosstie Research in North America
  Riley Edwards - University of Illinois Urbana-Champaign

Noon  Lunch - ECE Building - Room 3002

Rail Transit Keynote BART: Keeping The Bay Area Moving
  Robert Powers - Bay Area Rapid Transit
Tuesday Spoken Presentations

1:30  Session 3 - Crosstie Elastic Fasteners

Effect of Track Component Stiffness and Strength on Longitudinal Rail Seat Loads
   Marcus Dersch - University of Illinois Urbana-Champaign

Evaluating Glass Fiber Reinforced Composite Sleepers to Mitigate Spike Fatigue Failure: A Finite Element Study
   Shushu Liu - Volpe National Transportation Systems Center

Investigation of Spike Breakage at FAST and Revenue Service
   Yin Gao - MxV Rail

Screw Spike Spring Washer Resiliency and Installation Investigation: Preliminary Findings and Path Forward
   Christian Khachaturian & Marcus Dersch - University of Illinois Urbana-Champaign

3:10  Break

3:50  Session 4 - Track Inspection 1

3D Laser Scanning and Artificial Intelligence for Change Detection and Track Health Index Reporting
   Richard Fox-Ivey - Railmetrics
   Paula Palma and J. Riley Edwards - University of Illinois Urbana-Champaign

Locomotive Truck Mounted Track Measurement System
   Sabri Cakdi - Holland LP

Efficiencies in Track Maintenance: Tie Gang Automation
   Jeb Belcher - Loram

Fully Georeferenced Multi-Sensor 3-D Machine Vision Data Integration for Real-time Alerting of Crosstie and Fastening Asset Defects
   Darel Mesher - Tetra Tech

Precision Maintenance Planning: How VisioStack and BNSF Leverage Data to Automate Decisions
   Zach Garner - VisioStack
   Ben Klein - BNSF Railway

5:30  Adjourn Technical Sessions
6:00  Dinner at Memorial Stadium
Wednesday Spoken Presentations

8:00  Session 5 - Track Inspection 2
FRA Update on Comprehensive Track Assessment and Track Degradation Research
Radim Bruzek - ENSCO, Inc.

In Situ Inspection of Railroad Crossties by Lateral Migration Radiography
Timothy Mueller - University of Florida

Jiayi Luo - University of Illinois Urbana-Champaign

Field Verification of Elastic Modulus Measurements
Tim Stark - University of Illinois Urbana-Champaign

9:30  Break

9:50  Session 6 - Composite Crosstie Design and Performance
Thermal Effects on Material and Mechanical Properties of Composite Crossties
Jeremy Beasley - U.S. Army Engineer Research and Development Center

Laboratory Testing of Composite Ties or Composite Bearers for Turnouts
Stephan Freudenstein - Technical University of Munich

Establishing the Performance Frontier for EPC Ties in North American Freight Rail
Edmonn Maul - Evertrak LLC

Polymeric Sleepers - New Development Challenges
Aldo Machado - Braskem

Study of the Polymeric Crosstie Behavior Monoblock in AMV
Arthur Bilheri - University of Illinois Urbana-Champaign & MRS Logistica

New & Innovative Structural Materials for the Rail Industry
Claudio Subacchi - FSC Tech

Noon  Lunch - ECE Building - Room 3002

Class I Railroad Keynote  Engineering a Resilient Supply Chain
John Cech - BNSF Railway
Wednesday Spoken Presentations

1:30  Session 7 - Crosstie Support Investigations
Under-Tie Support Condition Assessment based on Tie Deflection Profiles
   Hai Huang - Penn State
Tie Reaction Measurement under Dynamic Loading using Rail-Mounted Strain Gauges
   Deb Mishra & MD Fazle Rabbi - Oklahoma State University
Track Support and Resilient Materials at BNSF - Experience and Research
   Erik Frohberg - BNSF Railway
   Brett Myskowski - University of Illinois Urbana-Champaign
Investigation into the relevance of UTP bedding modulus when measured using the Geometric Ballast Plate
   Scott Tripple & Dillon Benros - Pandrol
Proposed Coating Practices to Maximize Functional Life Spans for Concrete and Wood Components within RR Tracks and Bridges
   William H. Moorhead - TRAMMCO, LLC
   Jerry G. Rose - University of Kentucky

3:30  Break

3:50  Session 8 - Timber Tie Updates
Title Pending
   Jeff Lloyd - Nisus
Lifecycle of a Wooden Tie
   Brad Crawford - Stella-Jones Corporation
   Ryan Richardson - Loram
Using Asphalt as an Alternative for Under Tie Pads and Wood Tie Coating
   Ramez Hajj - University of Illinois Urbana-Champaign

5:00  Adjourn Technical Sessions
5:15  Dinner at Engineering Hall Patio
Robert Powers
General Manager
Bay Area Rapid Transit (BART)

The BART Board of Directors unanimously appointed Robert ("Bob") M. Powers as BART’s tenth General Manager on July 25, 2019. As General Manager, Powers manages an operating budget of $1 billion, oversees $1.4 billion in capital projects, and leads an agency with 4,000 employees that keeps the San Francisco Bay Area moving. Powers helps to carry out BART’s mission to provide safe, reliable, clean, quality transit service while putting the riders first and prioritizing the safety of all.

Powers, a licensed Professional Engineer, has more than 20 years of experience in the public transportation industry overseeing major infrastructure projects and transportation programs. He holds a Bachelor of Science degree in Civil Engineering and a Master of Science degree in Structural Engineering, both from the University of Illinois at Urbana-Champaign.

Powers began his career at BART in 2012 as the Assistant General Manager of Planning, Development and Construction where he was responsible for multi-million-dollar capital projects, including the expansion of BART service into Antioch and South Fremont, and all planning efforts to modernize stations and develop land near stations to help solve the Bay Area’s housing crisis and bring jobs closer to where people live.

Prior to joining BART, Powers served as the Deputy Director, and Director of Major Projects for the Seattle Department of Transportation (SDOT). He also served as the Division Chief of Transportation Engineering and Construction Division, as well as the Conduits Division, for the Baltimore City Department of Transportation (BCDOT).

Powers is currently on the Board of the American Public Transportation Association (APTA), Executive Board of the Bay Area Council, and serves as Chair of the Clipper Executive Board (CEB).

Class I Railroad Keynote

John Cech
Vice President, Engineering
BNSF Railway

John Cech was named vice president, Engineering in August 2018. Cech is responsible for the inspection, construction, maintenance and repairs of BNSF’s track, bridges, tunnels and other structures along BNSF’s right-of-way.

Cech has held various positions within Engineering since joining BNSF as a management trainee in 1994. He was promoted to roadmaster in Gallup, N.M., in 1996 and served in several roles with increasing responsibility including division engineer in Houston starting in 2000 and in Alliance, Neb., beginning in 2003. Cech was promoted to director, Roadway Planning, in 2006 and assumed the role of general director, Line Maintenance, in 2008. He served as assistant vice president, Engineering Services, from 2012 until 2014 and then served as assistant vice president and chief engineer, Central Region. Cech most recently served the Engineering Department as assistant vice president and chief engineer for System Maintenance and Planning.
Yeh Student Center - Newmark Civil Engineering Laboratory, 205 N. Mathews Ave, Urbana, IL 61801

Memorial Stadium - (Dinner in the 77 Club on 6th Floor - Enter Stadium at Gate 16 on the West side) - 1402 South 1st Street, Champaign, IL 61820

Transportation will be provided from the Yeh Student Center. If you wish to drive there are 2 parking options:

Parking Option 1 - Campus Recreation
201 East Peabody Drive, Champaign, IL 61820

Parking Option 2 - Assembly Hall
1800 South 1st Street Champaign, IL 61820
**Wireless Internet Connection:**

Choose the “IllinoisNet_Guest” wireless network.

Open an internet browser and the UI Wireless page should load.

Select the “Register a temporary guest account” link below the Log In.

Fill out the form, accept the terms of use, and click Register.

The University is legally required to collect your information before providing you with network access.

Click the Log In button at the bottom of your confirmation page.

For help with the Illinois wireless network, please contact the Help Desk at 217-244-7000.

Note: WiFi Registration forms are valid for a 24 hour period. A new registration form will need to be completed to gain access after 24 hours.

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http://railtec.illinois.edu/