Day 1: Thursday December 14, 2017

8:30  **Welcome and Introduction to the Needs of the Railroad Industry**
     Allan M. Zarembski, Professor, Director, Railroad Research and Safety Program, University of Delaware
     Charles Riordan, Professor, Vice Provost for Research, University of Delaware
     David Staplin, Deputy Chief Engineer Amtrak (retired) and Chairman of the Railroad Advisory Board at University of Delaware
     **Keynote Speaker: Charles "Wick" Moorman IV**, President, National Railroad Passenger Corporation (Amtrak)

9:45  **Session I: Railroad Needs from Big Data: A CIO’s Perspective**
     Session Chair: Charles "Wick" Moorman IV, Amtrak
     Lynden C. Tennison, Chief Information Officer and Senior Vice President, Union Pacific
     Ghada Ijam, Chief Information Officer, Amtrak
     Bill Zebrowski, Chief Information Officer, SEPTA

10:45 to 11:00 - Break

11:00  **Session II: Railroad and FRA Big Data Applications**
     Session Chair: Allan M Zarembski, University of Delaware
     Kevin Day, Assistant Chief Engineer, Technology, Testing and Standards, CN Rail
     Thomas Lamb, Chief Innovation and Technology, Office of Strategic Innovation and Technology, New York City Transit Authority
     Michael Messner, Assistant Director of Roadway Planning, BNSF
     Milad Hosseinipour, Amtrak, “New Approaches to Track Geometry Analysis”
     Jay Baillargeon, Program Manager, FRA, "Safe Rail Transportation, Powered by Big Data."

12:45 to 1:40 - Lunch

1:40  **Session III: Big Data: Applications and Case Studies: Railway Asset Management**
     Session Chair: Jackie van der Westhuizen, ENSCO
     Florian Auer, Director of Technology, and Krzysztof Wilczek, Head of Track Analytics, Plasser & Theurer Vienna “Digitalization of Railway Infrastructure”
     Willem Ebersohn, ENCADA, “Management Information Required to Develop TAM Plans for Engineering Assets using RILA Survey System”
     Sean Woods and Jackie van der Westhuizen, ENSCO, “Track Risk Assessment Using VTI Monitoring Data: A Big Data Application.”
3:30 to 3:45 - Break

3:45 **Session III: Big Data: Applications and Case Studies II**
Session Chair: **Todd Euston**, Vice President Engineering, Georgetown Rail (GREX)
**Michael J. Craft**, Principal Engineer – Track Geometry Amtrak Engineering
**David Pagliuco**, Quality Assurance Manager – Engineering, GREX, “150 Million Crosstie Study: Analysis of the Failure Modes of Crossties Imaged using Backscatter X-ray Technology”
**Robert Grant**, Managing Director, NxGen Rail Services “The Big Data Challenge: Managing Massive Amounts of data and Converting it into Information”
**Jesse Sipple** and **Jeff Cohen** BDI, “Growing Big Data Approaches and Applications in Nondestructive Evaluation of Infrastructure”

5:30 Day 1 sessions end

6:30 – 8:00 Cocktail Reception:
Atrium, STAR Campus, University of Delaware

**Day 2: Friday December 15, 2017**

8:00 **Session IV: Big Data Analysis Applications and Case Studies III**
Session Chair: **David Staplin**, HNTB/University of Delaware
**Jeffrey A. Keller**, IBM Global Services, “Rail Wear: A New Approach”
**Joseph Palese**, Senior Scientist, University of Delaware, “Using Big Data to Develop Rail Wear Forecasting Model”
**Bernhard Maier**, Plasser-American Corporation, “Condition Monitoring and Fault Prediction on Track Maintenance Machines”
**Israel Alguindigue** Vice President, Rail, Uptake, “Using Predictive Analytics for Prognostication of Problems in Locomotives for North American Class I Railroad: A Case Study”

10:15 – 10:30 Break

10:30 **Session VA: Big Data Analysis Theory and Techniques**
Session Chair: **Joseph Palese** University of Delaware
**Nii Attoh-Okine**, Professor, Civil & Environmental Engineering, and Director, Big Data Center, University of Delaware, “Leading Edge Analysis Techniques for Big Data”
Stan Aukamp, Senior Manager Data Platform and Reporting, and Ramesh Veerappan, Data Platform Architect, RailInc Corp. (subsidiary of AAR), “From Big Data Platform to Intelligent Data Platform - Hadoop Modernization”
Christopher Barkan, Professor, University of Illinois
Qing He, Assistant Professor, Civil & Environmental Engineering, University at Buffalo, SUNY, “Data-Driven Railway Track Defect Prediction”

12:00 Session VB: Big Data Analysis Theory and Techniques (cont.)
Session Chair: Qing He, University at Buffalo, SUNY
Mehdi Ahmadian, Professor and Director, Railway Technologies Laboratory, Virginia Tech, “Determining Track Geometry Through Non-contacting LIDAR Sensors”
Xiang Liu, Assistant Professor, Rutgers University, “Risk Analysis of Broken Rail Derailments”
Christopher Barkan, Professor, University of Illinois
Silvia Galvan Nunez and Nii Attoh-Okine, University of Delaware

1:20 Concluding Remarks
David Staplin, Deputy Chief Engineer Amtrak (retired) and Chairman of the Railroad Advisory Board, University of Delaware
Allan M. Zarembski, Director, Railroad Engineering and Safety Program, University of Delaware

1:30 Program Ends
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Modern Railways are making increasing use of new generation track inspection and operating technology to obtain more and more data on the condition of the track and equipment. This extensive amount of data, which includes data of increasing complexity as well as volume, has led to a condition known as “Big Data”, where the volume of data is such that traditional analysis techniques are no longer viable to efficiently make use of all of this large volume of data. Thus, important information is often buried in this “mountain” of data. Since railways need to convert this data into useable information to help them plan their capital maintenance programs, there is a need for the application of new and improved analysis techniques to make this conversion from data into information. One such area of improved data analysis is the use of “Big Data” statistical analysis techniques. Others include improved engineering modeling and more traditional statistical analysis techniques.

The 2017 conference is intended to expand on previous years’ conferences and introduce these new and emerging analysis techniques and to show how they can be applied to the large volume of inspection data collected by railways to improve their planning of the critical capital and maintenance programs. This year’s conference focuses on the railway’s specific needs and practical applications to date of “Big Data” analytics.