IHEEP 2025

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Sheraton Myrtle Beach - 2101 North Oak Street, Myrtle Beach, SC 29577

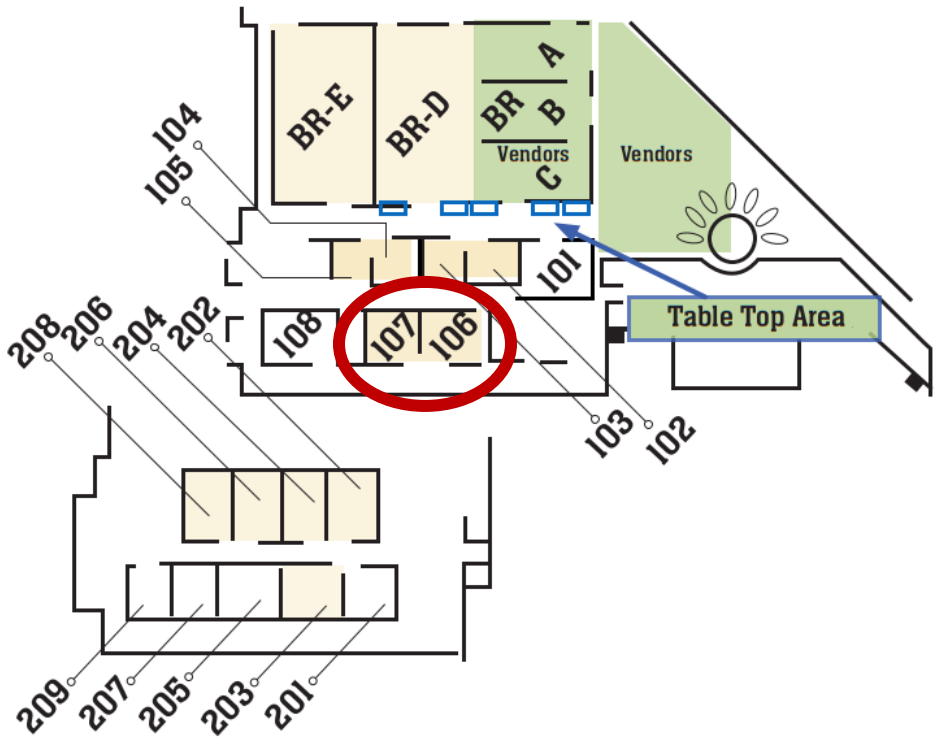
Session: Digital Workflow from Design to Construction for Pavements

Sponsored by the International Society for Intelligent Construction (www.IS-IC.org)

Agenda

Monday (October 6th, 2025) PM (EST) - (Room 106/107)

Time	Topic	Speakers
3:00 PM	Introduction	Dr. George K. Chang (Transtec Group, A Terracon Company)
3:00 PM – 3:25 PM	1 - Milling and Pavement Equipment and the Use of 3D Models	Laikram Narsingh (John Deere Wirtgen Group); Jim Preston (TOPCON)
3:25 PM – 3:50 PM	2 - Geometric and Material As-Built Data Collected by Road Construction Equipment	Laikram Narsingh (John Deere Wirtgen Group); Jim Preston (TOPCON)
3:50 PM – 4:15 PM	3 - Living Models in Asset and Pavement Management Systems with Updates from Machines	Tim Kowalski (John Deere Wirtgen Group) Chuck Hixon (Matt McDonald);
4:15 PM – 4:45 PM	4 - Agency's Perspective	Rebecca Embacher (MnDOT)
4:45 PM – 5:00 PM	5 - Contractor's Perspective	Scott Fernald (Granite Construction)
5:00 PM	Adjourned	



Abstracts

Introduction (Dr. George K. Chang)

The introduction will cover the overview of this workshop and a brief introduction to all speakers.

1 - Milling and Pavement Equipment and the Use of 3D Models (Laikram Narsingh and Jim Preston)

This presentation focuses on using 3D models for milling and paving. The three-part presentations include 1) Machine Setup Best Practices – key dos and don'ts when configuring equipment to ensure accurate model execution. 2) Model Building - what goes into creating a constructible model, and 3) Field Execution – what's needed to successfully use 3D models on site, including equipment, data flow, and crew coordination.

2 - Geometric and Material As-Built Data Collected by Road Construction Equipment (Laikram Narsingh and Jim Preston)

This presentation covers automatic documentation of data related to pavement profiles and paving parameters, as well as construction as-builts. It will also cover data format and storage, promoting data sharing between different equipment to provide operators with additional information for better management of the construction process.

3 - Living Models in Asset and Pavement Management Systems with Updates from Machines (Chuck Hixon and Tim Kowalski)

This session highlights how technology built into modern construction equipment, such as machine control, compaction measurement, and onboard sensors, can collect valuable as-built data. This session will demonstrate how this data can be integrated into asset and pavement management systems, supporting the creation of "living models" that enable owners to make informed decisions for planning, maintenance, and lifecycle management. Real-world examples will be used to illustrate the benefits and opportunities.

4 - Agency's Perspective (Rebecca Embacher)

This presentation will provide perspective from the agency's side. MnDOT has been the agency's leader in digital delivery with intelligent construction technologies (including intelligent compaction [IC], paver-mounted thermal profiles [PMTP], dielectric profiling systems [DPS], material delivery management systems [MDMS] – includes E-Ticketing, and Veta software) for two decades, with many practical and valuable lessons learned. Now, MnDOT is moving forward with more formalized processes for digital delivery, providing files directly in the contract for the contractors, best practices for generating models for automated machine-grade applications, incorporating 3D Ground Penetrating Radar data

into the modeling process, and establishing a holistic approach for the integration of intelligent construction technologies with the digital delivery process.

5 - Contractor's Perspective (Scott Fernald)

This presentation will comprise a paving contractor's perspectives on 3D construction as it relates to items such as model creation, savings (e.g., cost, time, resources, fuel, etc.), lessons learned (what works and what doesn't), digital as-builts, and the practical value of digital as-builts—straight from the field.

Speakers' Bios

Dr. George K. Chang, Transtec Group, a Terracon Company – President, ISIC

Dr. Chang has been a world expert on pavement smoothness and intelligent compaction/construction technologies for 3 decades. He founded the International Society for Intelligent Construction - ISIC (www.IS-IC.org). His research, teaching, specification development, and software tools have made significant contributions to advancements in the fields mentioned above. The websites he develops and maintains, Profile Viewing and Analysis - ProVAL and Intelligent Construction Technologies - Veta, have become a one-stop shop for pavement smoothness and intelligent compaction (IC)/construction technologies (ICT). Since 2007, he has led the implementation of IC/ICT efforts worldwide, including in the US, Europe, China, and Australia.

Laikram Narsingh (Nars), John Deere Wirtgen Group - Technical Application of ISIC North American Chapter

Nars joined the asphalt industry in 1990 as a project engineer with Ingersoll Rand's Paver Division, where he led the development of asphalt pavers. He held several other positions in the paving industry, such as Paving Applications Engineer, Product Support Manager, and Product Manager. Currently, Nars is employed by The Wirtgen Group as an application and technology specialist. His responsibilities include developing product specifications and providing support for paving applications and Intelligent Construction Technologies. Nars also holds the following industry roles: International Society of Intelligent Construction (ISIC) – North American Chapter: Technology & Application Coordinator; ISIC Technical Committee: Member; ISIC Sub-Committee 7 – Material Delivery Management Systems (MDMS): Technical Adviser; ISIC Sub-Committee 8 – Digital as Built (DAB): Technical Adviser; Roller Compacted Concrete Board of Directors: Member.

Jim Preston, TOPCON - Treasurer of ISIC North American Chapter

Jim is an Intelligent Paving Specialist at TOPCON. While attending Tri-State University and Ohio State University, Jim interned with civil engineering and Consulting firms, working with municipalities and DOTs on road and bridge applications. Jim found an interest in fieldwork and began engaging with the technology manufacturers. Over the last 28 years, Jim has worked with numerous technology companies and international markets in the fields of civil engineering, construction, and mining. Holding membership with the ISIC and NRRA technology committees, he continues to broaden the scope of solutions. Working with Topcon Positioning Systems, Jim is proficient in identifying applications that support the current and future needs of the industry.

Chuck Hixon, Matt McDonald - Digital Delivery Coordinator of ISIC North American Chapter

Charles Hixon is the Chief Digital Officer for North America at Mott MacDonald, where he advances digital capability, innovation, and technology integration, driving digital adoption to enhance business performance and client outcomes. He is nationally recognized for his expertise in the application of innovative design and construction technology, including Building Information Modeling (BIM), geospatial information systems (GIS), Laser Scanning, and Virtual Reality (VR).

Tim Kowalski, John Deere Wirtgen Group - Chair of ISIC North American Chapter, Vice President/Executive Committee of ISIC

Tim is an Applications Support Manager at John Deere Wirtgen Group. Tim has a Bachelor of Science Degree in Construction Administration and a minor in Business Management from the University of Wisconsin–Madison. He has been in the construction business for over 28 years, 17 of which have been spent working on the Quality Control of Asphalt, Aggregates, and concrete. Tim has taught courses, made presentations, and published articles on various topics related to equipment functionality and materials. He has served on numerous committees and task groups for NCAT, NAPA, and ASTM, as well as in the states of Wisconsin, Illinois, and Colorado, among others. Tim is the Applications Support Manager for Wirtgen America Inc., specializing in Hamm rollers. He works closely with their District Sales Managers, Dealers, & Customers throughout North America, helping them

understand Hamm products and processes through mix design, equipment function, and material usage to become more efficient and competitive. Tim recently completed a study with the FHWA and Transtec Group on Intelligent Compaction (IC) rollers, examining the correlation between stiffness and density. He has been involved with all nine of the FHWA Demo projects over the last three years, extensively using this technology, and this will continue in the future.

Rebecca Embacher, Advanced Materials and Technology Engineer, MNDOT – Technical Committee of ISIC

Ms. Embacher earned her M.S. in Civil Engineering at the University of Minnesota. She has worked as a research engineer at the University of Minnesota and the Minnesota Department of Transportation, a pavement engineer at American Engineering and Testing, Inc., and an Assistant Grading and Base Engineer at the Minnesota Department of Transportation. She is currently the Advanced Materials and Technology Engineer at the Minnesota Department of Transportation. Her areas of experience include the physical and mechanical properties of concrete, pavement design and preservation, seasonal load limits, research and development, earthwork/embankment, and pavement construction. Additionally, she has implemented intelligent construction technologies during the past 20 years. This includes technologies such as machine guidance for excavation, grading, milling, and paving; intelligent compaction for reclamation and bituminous applications; paver-mounted thermal profiling; e-construction/e-ticketing/MDMS; determination of Veta features; digital delivery; and other advanced technologies.

Scott Fernald, Granite Construction - Automation Technology Coordinator of the ISIC North American Chapter

Scott is a construction manager at Granite Construction, Inc. With a 26-year career in the construction industry, Scott Fernald has spent the past 23 years dedicated to Granite Construction. Beginning his tenure at Granite as a Project Engineer, later advanced to Project Manager and now serves as a Construction Manager overseeing asphalt paving operations for the Utah Region. Known for his strong passion for innovation, Scott also holds the role of Construction Technology Manager, where he leads efforts to integrate and advance construction technologies, always driven by a desire to "make things better."

Contacts

Jim Preston, +1 (614) 832-1181, JPreston@TOPCON.com

George Chang, +1 (512) 913-1847, GKChang@TheTranstecGroup.com