

28TH ANNUAL

SURVEY TECHNICAL WORKSHOP

Breezy Point Conference Center • March 24-26, 2026



Cover photo submitted by Brandon Davis

Welcome to the 28th Annual Survey Technical Workshop

March 24 – 26, 2026



Sponsored by: The Office of Land Management Minnesota Department of Transportation

Director, Office of Land Management..... Joseph Pignato
Assistant Director, Survey & Mapping Geoff Bitner
Workshop/Training Coordinator..... Lorianna Yang
A/V Support..... Fred Bertram
IT Support..... Blaine McKeever
Workshop Support..... Jack Drouin

Workshop Planning Committee:

Nathan Anderson MnDOT (St. Paul)
Geoff Bitner MnDOT (St. Paul)
Jeremy Erickson..... MnDOT (Detroit Lakes)
Joe Hamlin MnDOT (Metro)
Tyler Hanstad..... Stonebrooke Engineering
Michael Hendrickson MnDOT (Rochester)
Peter Jenkins MnDOT (Retired)
Bud Jorgenson MnDOT (St. Paul)
Melissa Fischer MnDOT (Metro)
Sarah Keeling..... Washington County
Troy Klein..... Wright County
Justin Kraus WSB
Richard Morey MnDOT (Retired)
Michael Nelson..... MnDOT (Metro)
James Schneider..... MnDOT (St. Paul)
Travis Shorter..... MnDOT (St. Paul)
Christian Sovak MnDOT (St. Paul)
Kevin Sutherland..... MnDOT (Duluth)

FROM THE WORKSHOP COMMITTEE

The Minnesota Department of Transportation welcomes you to the 2026 Survey Technical Workshop. This event marks the 28th year that the Office of Land Management has sponsored this workshop, and we are happy and committed to offering this training year after year. We want to acknowledge the contributions of our public and private sector partners, who continue to help us make this workshop a success.

This workshop allows all interested parties the opportunity to review current practices, examine prospective trends, consider technical improvements, and build relationships within the surveying community.

The workshop committee is comprised of county, private sector, and MnDOT employees. The committee has worked hard to compile session topics that are hopefully pertinent and interesting to those involved in survey operations throughout the State of Minnesota. The committee diligently reviewed previous evaluation forms and made every attempt to improve the workshop based on the comments and suggestions made by attendees. Please remember to fill out the presenter evaluation form you received when you checked in at the registration table. We encourage you to fill it out as you complete each session, so it won't be such a daunting task to complete at the end of the workshop.

Please note: Attendees will be emailed a quick Workshop Summary Evaluation after the 2026 Survey Technical Workshop. Please take a moment to complete the survey when you receive it, as your feedback is important to us for planning future workshops. Please feel free to contact anyone on the workshop committee with comments or suggestions regarding the workshop. The names of the committee members are on the first page of this booklet.

The workshop sessions have been arranged in both plenary and concurrent formats. Please take a few minutes to review the schedule, session descriptions, presenter biographies, and vendor summaries in this booklet, as they will assist you in determining what sessions you may like to attend to maximize your learning experience.

If you would like to speak more privately with a vendor in the display area in the Minnesota I & II rooms during the workshop, please do so. While we encourage attendance at all the sessions, we realize this may be the best time for you to ask the vendors questions.

For those submitting for Professional Development Hours with the *Board of Architecture, Engineering, Land Surveying, Landscaping Architecture, Geoscience, and Interior Design*, please select those sessions that will meet your training needs and satisfy your defined licensing standard requirements. Workshop participants are responsible for submitting for Professional Development Hours with the Board.

We would like to thank the presenters for generously sharing their time and knowledge and for providing us with the opportunity to learn and ultimately improve the services we provide. Last but not least, a special thanks to you, the participant. This workshop would not exist without your continued support and enthusiasm. We encourage your participation in each of the sessions. The evening will provide you with a more casual environment to consider and discuss the day's materials and sessions.

FOR YOUR INFORMATION:

- **Workshop Program** – The program contains the schedule, session descriptions, and presenter and vendor biographies.
- **Quick Reference Guide** – This is for your convenience in finding sessions of interest.
- **Presenter Evaluation Form** – Please turn in this form at the end of the workshop. This evaluation is essential as we consider pertinent topics for future workshops. It also provides us with information about how specific topics were received and about the workshop presentations in general.
- **Name Tag** – Please wear the name tag you will receive when you sign in throughout the workshop. Not only do we want to know who you are, but your name tag will identify your company and/or place of employment.

**This year's name tags will have a special barcode for test scanning that will start after lunch on Tuesday, March 24 through Wednesday, March 25.*

- **Meal Tickets** – If you have purchased the Breezy Point Lodging & Meal Package or commuter meals, you can pick up your meal tickets prior to workshop registration at the Breezy Point front desk in the main lobby. You will also have the option to pre-register for your room if you have made lodging reservations. If you need to purchase meal tickets, they are available for sale at the Breezy Point front desk.

**THANK YOU
FOR SUPPORTING
MNDOT'S 2026 SURVEY
TECHNICAL WORKSHOP**



2026 SURVEY TECHNICAL WORKSHOP SCHEDULE

TUESDAY, MARCH 24, 2026

WHITEBIRCH I & II			
9:00 AM	WORKSHOP REGISTRATION		
10:00 AM	WELCOME AND OPENING REMARKS Geoff Bitner, Assistant Director Office of Land Management		
10:15 AM	GEOMATICS UNLEASHED: DRIVING CONFIDENCE IN COMPLEX INFRASTRUCTURE PROJECTS Jon Gustafson		
12:15 PM LUNCH IN MINNESOTA I & II			
	WHITEBIRCH I	WHITEBIRCH II	LAKESIDE RM.
1:15 PM	CURIOSITIES, ODDITIES, AND SCANDAL IN THE PLSS (I) Preston Dowell	TREES AND NOXIOUS WEEDS: IDENTIFICATION TIPS AND TRICKS (B) Christina Basch & Hannibal Hayes	RDO EQUIPMENT CORE TECHNOLOGY (B) Ava Hanson & Shaun Joy
2:15 PM	START TO FINISH – STAKING A ROUNDABOUT (I) Justin Kraus	THE 1890 LAND SURVEY FOR THE TOWN OF ST. LOUIS (I) Anthony Lueck	DRONE SURVEY MAPPING BEST PRACTICES (B/I) Luis Rojas
3:15 PM BREAK IN MINNESOTA I & II			
3:30 PM	MENTAL HEALTH, SUICIDE AWARENESS, AND COMMUNITY SUPPORT (B) Dr. Debra Lindh, Ed.D.	BRIDGE STAKING: AN OVERVIEW FOR BEGINNERS (B) Adam Olson	TOTAL STATION & PRISM BEST PRACTICES (A) Dylan Jones & Weston Schneider
4:30 PM	ADJOURN		
5:30 PM	DINNER IN MINNESOTA I & II		



2026 SURVEY TECHNICAL WORKSHOP SCHEDULE

WEDNESDAY, MARCH 25, 2026

6:45 AM BREAKFAST IN MARINA DINING ROOM			
	WHITEBIRCH I	WHITEBIRCH II	LAKESIDE RM.
8:00 AM	CONFINED SPACE SCAN DELIVERY: TUNNELS, STRUCTURES, AND MORE (B) Kyle Splittstoesser	THE 1921 U.S. SUPREME COURT ST. LOUIS RIVER BOUNDARY BETWEEN MINNESOTA AND WISCONSIN (I) Anthony Lueck	MENTAL HEALTH, SUICIDE AWARENESS, AND COMMUNITY SUPPORT (B) Dr. Debra Lindh, Ed.D.
			REPEAT
9:00 AM	MNDOT PHOTO AND LIDAR TARGETING GUIDELINES (B) Christian Sovak	HYDROGRAPHIC AND NON-GROUND LIDAR SURVEYING (I) Juergen Brunkhorst, Andrew Moody, Miles Strain	TRIMBLE CONNECT – NEW UPDATES AND BEST PRACTICES (I) Tony Edelbrock & Evan Traxler
10:00 AM BREAK IN MINNESOTA I & II			
10:15 AM	APPLIED UAS TECHNOLOGY FOR SURVEYORS AND ENGINEERS (B) Colin Lee & Katy Rudolph	SURVEYOR SAFETY (B) Ben Bloom	ALIGN YOUR POINT CLOUD STRATEGY WITH YOUR OPERATIONAL AND BUSINESS OBJECTIVES (I) Ted Knaak
11:15 AM	NEW NGS 2022 DATUMS (MID-2026) / NATRF/PATRF 2022 AND NAPGD2022 (A) Bob Green & Steve Richter	RECONSTRUCTING THE LINE: A SURVEYOR'S JOURNEY REBUILDING HIGHWAY 5 IN EAST ST. PAUL (I) Michael Nelson	EXTRACTING COMPACT DELIVERABLES FROM MASS POINT CLOUDS USING A CUSTOMIZED GIS APPROACH (A) Jeffrey Walsh
12:15 PM LUNCH IN MINNESOTA I & II			
1:15 PM	TRIMBLE ACCESS – ASK THE EXPERTS (I) Tony Edelbrock, Dylan Jones, Weston Schneider, Steve Richter, Evan Traxler	FUNDAMENTALS OF SURVEY MEASUREMENT (PART 1) (I) Sam Gibson	ROADMAPPING: NOT ROADS BUT GEOSPATIAL SYSTEMS & WORKFLOWS (B) Bradford Folta
2:15 PM	MNDOT AS-BUILTS & COLLECTION (B) Michelle Pasko	FUNDAMENTALS OF SURVEY EVIDENCE (PART 2) (I) Sam Gibson	SENSOR STACKING AND FUSION WITH YOUR GNSS ROVER (B) Roger Shulz
3:15 PM BREAK IN MINNESOTA I & II			
3:30 PM	PREPARING FOR THE NEW DATUM (B) Geoff Bitner	A NON-TECHNICAL GUIDE TO STATE BURIAL AND ARCHAEOLOGY LAWS & PROCEDURES (B) Jennifer Tworzyanski & Selena Bernier	MAPPING UNDERGROUND UTILITIES WITH HIGH ACCURACY GPS AND EM LOCATORS (B) Joe Webb
4:30 PM ADJOURN			
5:30 PM DINNER IN MINNESOTA I & II			



2026 SURVEY TECHNICAL WORKSHOP SCHEDULE

THURSDAY, MARCH 26, 2026

6:45 AM BREAKFAST IN MARINA DINING ROOM			
	WHITEBIRCH I	WHITEBIRCH II	LAKESIDE RM.
8:00 AM	<i>PREPARING FOR THE NEW DATUM (B)</i> Geoff Bitner	<i>RECONSTRUCTING THE LINE: A SURVEYOR'S JOURNEY REBUILDING HIGHWAY 5 IN EAST ST. PAUL (I)</i> Michael Nelson	<i>CARLSON SURVEY FUNDAMENTALS (B/I)</i> Luis Rojas
	REPEAT	REPEAT	
9:00 AM	<i>ETHICS FOR THE DAILY PRACTITIONER (B)</i> Joshua Root	<i>HOSTILE WORKPLACE: CREATING A DATA FRIENDLY ENVIRONMENT AMONGST DEPARTMENTAL SILOS (B)</i> Bradford Folta	<i>WORKING WITH POINT CLOUD DATA (AERIAL AND GROUND SCANS) (B/I)</i> Luis Rojas
10:00 AM BREAK IN MINNESOTA I & II			
WHITEBIRCH I & II			
10:15 AM	<i>BLATNIK BRIDGE REPLACEMENT OVERVIEW</i> Pat Huston		
11:30 AM ADJOURN			

Schedule is subject to change

PRESENTATION GUIDE	
(B)	Beginner Session
(I)	Intermediate Session
(A)	Advanced Session
	Vendor Session

Session Descriptions and Presenter Biographies

WELCOME AND OPENING REMARKS

Joseph Pignato, P.E. – Director, MnDOT Office of Land Management

Joe Pignato is the Director of the Minnesota Department of Transportation's (MnDOT) Office of Land Management. In this position, he provides overall leadership to the Office of Land Management regarding technical engineering, land surveying, real estate guidance, and administrative direction so that staff are trained, and resources effectively utilized in support of MnDOT's mission. Joe has been with MnDOT since 1997, where he has worked in the areas of Consultant Services, Legislation, State Utility Engineer, Right of Way, and Special Projects. Prior to MnDOT, Joe worked for a local Minnesota consulting firm for ten years as a structural design engineer. He graduated from North Dakota State University with a degree in Civil Engineering.

Geoff Bitner – Assistant Director, MnDOT Office of Land Management

Mr. Bitner is a licensed Land Surveyor and supervises the Survey & Mapping Section with the Minnesota Department of Transportation's Office of Land Management. He joined MnDOT in 1998 as a Survey Technician and has been with the Office of Land Management since 2007. He has held positions has a Survey Crew Chief, District Land Surveyor, Geodetic Surveyor, Right of Way Mapping Supervisor, Platting Unit Supervisor, and most recently as the Assistant Director of the Office of Land Management. Mr. Bitner holds a Bachelor of Science Degree from Salisbury University in Maryland and a Master of Science Degree from the University of Minnesota.

OPENING SESSION:

GEOMATICS UNLEASHED: DRIVING CONFIDENCE IN COMPLEX INFRASTRUCTURE PROJECTS

Presented by Jon Gustafson

This session explores how advancements in UAS, mobile LiDAR, 3D laser scanning, and AI/ML are reshaping the way complex infrastructure projects are planned and delivered. By demonstrating how these technologies work as an integrated geomatics ecosystem rather than isolated tools, the presentation highlights their ability to produce high-fidelity data, accelerate workflows, and strengthen decision-making. A flagship design-build project showcases how unified spatial data supported by survey control, automated feature extraction, and millimeter-level scanning created a trusted foundation for digital project delivery. Attendees will see how this approach improves schedule certainty, reduces risk, and enhances collaboration across stakeholder groups. Ultimately, the session positions geomatics as a strategic driver of digital transformation, delivering greater confidence and measurable value in high-risk project environments.

Jon Gustafson – WSP USA

Jon Gustafson is a seasoned geospatial and surveying executive with more than 20 years of experience leading high-performing teams and delivering transformative technology, geomatics, and infrastructure programs across North America. He currently serves as the Midwest Region Geomatics Lead at WSP, where he oversees surveying and geospatial operations across a 15-state region and drives strategic growth in transportation, energy, water, and infrastructure markets. Throughout his career, Jon has led large, multidisciplinary

teams, managed over \$50 million in federal and state programs, and pioneered innovation initiatives spanning UAS, lidar, AI, 3D modeling, and digital project delivery. Widely recognized as an industry leader, he brings deep expertise in strategic planning, technology integration, data governance, and operational excellence to help organizations unlock the full value of geospatial data. Jon is also a Certified Federal Surveyor, Professional Surveyor in eight states, PMP, GISP, and a FAA Part 107 Certified Remote Pilot with a history of published research, national standards work, and award-winning contributions to the geospatial community.

The workshop sessions that follow are listed in this program in alphabetical order for quick reference

A NON-TECHNICAL GUIDE TO STATE BURIAL AND ARCHAEOLOGY LAWS & PROCEDURES

Presented by Jennifer Tworzyanski & Selena Bernier

Have you ever wondered what to do while out in the field and run across what you think is an archaeological site? If so, this session is for you, starting with what is archaeology in Minnesota, anyway? The state laws pertaining to archaeological sites, burial sites, and cemetery sites, as well as who has legal authority over those sites will be discussed. As land surveyors, you can play a unique role in helping to record this state's history, and this session can give you the information necessary to do just that.

Jennifer Tworzyanski – Office of the State Archaeologist

Jennifer Tworzyanski is an assistant to the Minnesota state archaeologist. She has an MA in historical archaeology and an MS in data intelligence and geanalytics. She has worked in both private and public sector archaeology in Minnesota for twenty years and has worked at the Minnesota Office of the State Archaeologist for over seven years. Jennifer has also worked throughout the Midwest and in New York, as well as in England, Spain, Ireland, and Egypt. Her areas of interest are historical and contemporary archaeology, the expression of human activities on the landscape, and archaeological education and outreach to all ages.

Selena Bernier – Minnesota Indian Affairs Council

Selena Bernier is a Cultural Resource Manager for the Minnesota Indian Affairs Council. She is a member of the Bad River Band of Lake Superior Ojibwe. She is a PhD candidate in Anthropology at the University of Minnesota. Her academic focus is on Indigenous Archaeology and the reinterpretation archaeological copper of the Great Lakes. Her professional role allows her to utilize her drive for preservation, protection, and repatriation of Indigenous sacred sites and items associated.

ALIGN YOUR POINT CLOUD STRATEGY WITH YOUR OPERATIONAL AND BUSINESS OBJECTIVES

Presented by Ted Knaak

Survey operations typically adopt processes that come with the equipment they purchase. The result has been that ecosystems are optimized locally, but these enterprises rarely unify the governance of data and processes above them. The results are low productivity, inefficient allocation of resources, and missed opportunities for survey consulting services throughout a project lifecycle. This presentation describes TopoShare, a data governance

process that democratizes survey data and services across stakeholder operations throughout a project lifecycle. The TopoShare process is easily implemented, unlimited in scale, and affordable at every level of enterprise.

Ted Knaak – TopoDOT Solutions LLC

Ted Knaak is currently president and owner of TopoDOT LLC, a Florida software company founded in 2011. TopoDOT software is employed worldwide as a comprehensive solution to geospatial point cloud data processing. Ted has over 25 years' experience in the industry having founded Rigel USA in 1993 to market and apply Riegl LiDAR technology across North America. Earlier in his career, Ted was a control systems analyst for GE Space Systems. Ted holds Master of Science Degrees in electrical and mechanical engineering from Brown and Drexel universities.

APPLIED UAS TECHNOLOGY FOR SURVEYORS AND ENGINEERS

Presented by Colin Lee & Katy Rudolph

In modern engineering workflows, the transition from field observation to design-ready data is being revolutionized by Uncrewed Aircraft Systems (UAS). This presentation explores how UAS deliverables bridge the gap between raw aerial data collection and actionable project insights. By leveraging high-fidelity spatial data, engineering teams can significantly enhance the design, maintenance, and inspection of critical infrastructure. We will examine the integration of photogrammetry and Lidar into BIM/CAD/GIS environments, the safety and cost advantages of aerial remote sensing, and the specific deliverables—such as 3D models and point clouds—that are now standard requirements for complex infrastructure projects.

Colin Lee – Minnesota Department of Transportation

Colin Lee serves as a certified photogrammetrist and mapping supervisor at the Minnesota Department of Transportation (MnDOT), bringing over 20 years of expertise in remote sensing. He leads the development and management of the agency's UAS and mobile lidar programs, specializing in creating advanced workflows for complex lidar and photogrammetric engineering projects.

Katy Rudolph – Frontier Precision, Inc.

Katy has been with Frontier Precision since 2019 with a background in custom software account management. She initially started on the mapping and GIS side for MN. In 2023 she joined the Unmanned team and currently focuses on providing UAS solutions, support, and training to a number of industries including civil engineering, survey, public safety, land management, conservation, law enforcement, and utilities in the MN & WI.

BLATNIK BRIDGE REPLACEMENT OVERVIEW

Presented by Pat Huston

The Blatnik Bridge is close to reaching the end of its life, and without replacement, will be further restricted or closed in about 2030. At a total project cost of \$1.8 billion, it's the largest project in MnDOT history. The session will cover all aspects of environmental study, preliminary engineering and everything else that goes into getting a major project to the construction starting line. The project team has been working on project development at an accelerated pace since August of 2020.

Pat Huston – Minnesota Department of Transportation

Pat Huston is a graduate civil engineer from the U of M Twin Cities campus and has been with MnDOT District 1 for 35+ years, in addition to two years with the BNSF Railroad prior to that. He feels fortunate to have had the opportunity to gain experience in a wide variety of positions in District 1 over the years in his hometown of Duluth, without having to move. Since 2014, he's led (and is leading) three major projects: The TH 53 Realignment CMGC project in Virginia, Twin Ports Interchange CMGC in Duluth, and now the joint MnDOT/WisDOT Design-Build Blatnik Bridge Replacement Project in Duluth. He says major projects are a blessing and a curse - maybe he'll explain that later. He says the best part of working on major projects is the people he works with, the team work, and project taglines like "ain't no can't", "failure is not an option", "what does not kill you makes you stronger" and "this is so exciting, I can't wait to see how it turns out!" He is married with two grown children, and in his spare time loves being at the cabin or deer camp with family & friends, snowmobiling, ATViing, backpacking and being a volunteer clearing trail for the Boarder Route Trail Association.

BRIDGE STAKING: AN OVERVIEW FOR BEGINNERS

Presented by Adam Olson

This session is designed to give someone who has never staked a bridge before, a brief overview on what goes into bridge staking. It will touch on the basics of the plan, pre-construction office work and the field work involved.

Adam Olson – Minnesota Department of Transportation

Mr. Olson studied Surveying and Construction Technologies at North Dakota State College of Science in Wahpeton, ND, and has been involved with MnDOT's Survey Operations since 1997. He worked as a Student Worker for the Fergus Falls office until September 1998 when he started full time for Metro East Surveys in Oakdale. In February of 2004, Mr. Olson began working as a Crew Chief and in July 2004, was officially promoted to Crew Chief (Transportation Specialist). In August 2013 he was promoted and is currently working as an Engineering Specialist. During his time with MnDOT, Mr. Olson has worked on many bridge projects including the Lafayette Bridge over the Mississippi River (US Highway 52), the St. Croix River Crossing over the St. Croix River (MN Highway 36/WI Highway 61), and the Smith Ave High Bridge over the Mississippi River (MN Highway 149).

CARLSON SURVEY FUNDAMENTALS

Presented by Luis Rojas

In this session, Carlson project setup best practices, boundary data entry and legal descriptions writing, and field-to-finish will be discussed. In addition, creating a surface model and topo map will also be presented.

Luis Rojas – Carlson Software

Luis Rojas is a Civil Engineer that has been in the land development industry for over 30 years where he has supported, trained and helped adopt mobile, desktop and field solutions for hundreds of organizations and users in the Architectural, Engineering and Construction (AECO) industry around the world. Some of the applications that he has implemented include Carlson, Civil 3D, Revit, and Navisworks for companies such as Skanska, Siemens, Parsons, Arup, NRCS, and US Army. Luis has been a speaker at industry events including Autodesk University, UAV Expo, RTC, AEC Next, IPLSA, HLSA conference, CLSA-NALS conference, LSAW conference, WSPLS conference, MnDOT Workshop, and others

nationally and internationally in Europe, Asia, and South America. Published author on XYHT Magazine.

CONFINED SPACE SCAN DELIVERY: TUNNELS, STRUCTURES, AND MORE

Presented by Kyle Splittstoesser

That point cloud looks really cool, but how do we use it?" This presentation covers confined space scanning techniques and best practices. It introduces a few basic concepts and key workflow components applicable to multiple software and equipment platforms. Key principles emphasized are planning, safety, accuracy, and efficiency, along with the importance of the survey-design relationship. The workflow includes scanning, registration, and making point clouds usable in CAD platforms (linework), with strategies like using sphere and B/W targets, double scanning, and georeferencing. Finally, it addresses challenges and explains how creative target matching ensures reliable data.

Kyle Splittstoesser – Minnesota Department of Transportation

Kyle's journey into land surveying began with his passion for land navigation during his military service. After earning a technical degree from St. Cloud Community and Technical College, he advanced his education at St. Cloud State University, completing his bachelor's degree. In 2013, Kyle entered the private sector, where he built over a decade of experience before joining MnDOT in 2024. Today, he is a licensed professional land surveyor in the state of Minnesota.

CURIOSITIES, ODDITIES AND SCANDAL IN THE PLSS

Presented by Preston Dowell

When we look at original GLO survey we find curious cases, odd geometry and scandalous surveys. We will discuss an interesting case highlighting these issues and how they were addressed.

Preston Dowell – St. Louis County

Preston Dowell is a Deputy Land Surveyor with St. Louis County, Minnesota where he primarily works on restoration of the PLSS. He has led the effort to integrate spatially accurate PLSS data into the St. Louis County tax parcel databases. He aids other county departments on best practices for integrating survey data into their daily duties.

DRONE SURVEY MAPPING BEST PRACTICES

Presented by Luis Rojas (Biographical Reference: Carlson Survey Fundamentals)

In this session, best practices to plan photogrammetry and LiDAR missions for drone survey mapping will be discussed. This session will also include a brief review on processing the images and using the resulting orthoimage and point cloud data to create the map.

ETHICS FOR THE DAILY PRACTITIONER

Presented by Joshua Root

Session will highlight industry expectations for professionals in the Real Estate, Survey, Engineering and Interior Design professions including the professional obligations and statutory expectations. Participants will come away with an understanding of what they are required to do and some tips on how to manage the risks associated with non-compliance. Participants will get to learn from the lessons of others and earn a continuing education credit while having fun with their colleagues.

Joshua Root – Minnesota Department of Transportation

Joshua Root serves as Deputy Chief Counsel for the Minnesota Department of Transportation, providing strategic legal guidance on transportation policy, regulatory compliance, and risk management. With extensive experience in public sector law, Joshua advises on complex contractual agreements, procurement processes, and litigation matters impacting statewide transportation initiatives. Joshua came to MnDOT as eDiscovery Counsel in the tragic aftermath of the 35W bridge collapse having represented corporate clients in “bet the business” litigation. Joshua is committed to advancing transportation solutions that align with Minnesota’s statutory framework and public interest, leveraging deep expertise in administrative law and government to support MnDOT’s mission of providing a safe, efficient, and sustainable transportation system.

In addition, Joshua is an active contributor to the Sedona Conference Working Groups 1 and 13, a member of several NCHRP panels, and the Chair of TRB AQL11 (Select Topics in Transportation Law). As Chair Josh is working to bring together the combined legal committees in a way that ensure the sundry of legal topics that are important to our members are represented.

EXTRACTING COMPACT DELIVERABLES FROM MASS POINT CLOUDS USING A CUSTOMIZED GIS APPROACH

Presented by Jeffrey Walsh

This will be a presentation focused on using a customized GIS approach for extracting terrain deliverables from mass point clouds without interpolation or loss of accuracy. A wide range of output formats are possible with very small file sizes. Will provide a live data processing demo if possible.

Jeffrey Walsh – Whirrx

Jeff has 26 years of experience working on diverse GIS, Remote Sensing, and Enterprise Architecture projects. Jeff specializes in advanced terrain processing and extending GIS workflows using scripts and coding. Regarding sUAS technology, Jeff is primarily focused on building and refining unmanned systems capable of attaining the highest possible 3D accuracy. Jeff has a Professional Masters in GIS, is an ASPRS Certified Photogrammetrist, a Remote Pilot, and a Private Pilot.

FUNDAMENTALS OF SURVEY EVIDENCE

Presented by Sam Gibson

The land surveyor’s core task of establishing and retracing boundaries ultimately depends on the evaluation and application of law, convention, and professional standards to survey evidence. This presentation will explore the fundamentals of survey evidence as it relates to these core land surveying functions. Concepts such as priority of evidence, burden of proof, and the distinction between error and ambiguity will be examined to illustrate how evidence is interpreted, weighed, and reconciled, and how measurement results are properly integrated into defensible boundary determinations. Participants will apply measurement concepts introduced in Fundamentals of Measurement within an evidentiary framework to support professional judgment and compliance with legal and conventional standards in boundary surveying.

Sam Gibson – Washington County

Sam Gibson PLS, received his initial instruction in surveying at the Inter-Service Engineering School at Fort Leonard Wood, Missouri. He received an Associate’s Degree in

Construction Technology from the Community College of the Air Force, and his Bachelor's Degree from University of Northern Iowa. He has held a variety of surveying positions in Iowa and Minnesota in both the private and public sectors. He was licensed as a Land Surveyor in the State of Minnesota in 2006. He spent 12 years as Chief Surveyor for the City of Saint Paul leading the St Paul Public Works, Survey and GIS Division from 2016 to 2019. Sam is, President Elect for the Minnesota Society of Professional Surveyors (MSPS), an adjunct instructor in Land Surveying for Dakota County Technical College (DCTC) and has served as the County Surveyor for Washington County Minnesota since October 2019.

FUNDAMENTALS OF SURVEY MEASUREMENT

Presented by Sam Gibson (Biographical Reference: Fundamentals of Survey Evidence)

The land surveyors' core tasks of establishing and retracing boundaries are sometimes obscured by a focus on the high levels of precision readily achieved with modern measurement tools. This presentation will examine the fundamentals of measurement as they relate to these core land surveying functions. Concepts such as accuracy versus precision, errors of closure, instrument tolerances, equipment maintenance, and field setup will be explored to clarify the reliability and limitations of measurement results, and to support their appropriate application in boundary surveying practice. Participants will develop a foundational understanding of measurement uncertainty that supports the learning objectives of the companion session, Fundamentals of Survey Evidence.

HOSTILE WORKPLACE: CREATING A DATA FRIENDLY ENVIRONMENT AMONGST DEPARTMENTAL SILOS

Presented by Bradford Folta

People will be people, and data doesn't care. In this talk, you get to pitch a fit and hear about your dataflow, interdepartmental, and intradepartmental issues. We think through how we can bridge, mitigate, or reduce these issues to enable data flow (FYI: data doesn't care about how people feel) from one department to another. Focusing on making people see their part in the flow rather than just a job. Come have fun, discuss, and be ready for an in-depth discussion.

Bradford Folta – Honey Badger Analytics LLC.

Data. What is it? What does it do... how does it fit into the larger picture? How do you play a part? Bradford thinks about this. Often too much. He has worked in many different types of environments and sectors, all centered around infrastructure, except for IKEA, which used infrastructure. His expertise is process-thinking, or how we take something and turn it into something else. Sounds like he does nothing, but nothing is something when you think about the world around you and how it's all interconnected.

HYDROGRAPHIC AND NON-GROUND LIDAR SURVEYING

Presented by Juergen Brunkhorst, Andrew Moody, and Miles Strain

When the water is coming in over your waders it is time to consider alternative methods. This presentation will be a combination of hydrographic surveying as an independent survey process and also show how Lidar can be used for more than just measuring the ground. We'll show recent professional practices and experiences of hydrographic surveying in and around Minnesota. The second half of the presentation will focus on how Lidar can be used for more than just mapping terrain. Most notable focus will be on the planning, processing, and mapping of power lines and structures, as well as other above ground detail.

Juergen Brunkhorst – Widseth

Juergen Brunkhorst is a Professional Land Surveyor and Certified Hydrographer at Widseth. With a survey career spanning over 30 years in Germany and the USA, and on land and on water, he maintains a passion for hydrographic surveying. Juergen graduated from Germany's Hamburg University of Applied Sciences with degrees in Land Surveying and Hydrographic Surveying. He regularly presents to students at St. Cloud State University. He is enthusiastic about sharing underwater surveying insights with his land surveying peers. Outside of work Juergen enjoys riding unicycle and playing accordion, sometimes at the same time.

Andrew Moody – 95West Aerial Mapping

Andrew Moody is an ASPRS Certified Lidar Technologist. He graduated from the University of Wisconsin – River Falls with a degree in Geography. With nearly 15 years of experience in the lidar and mapping field, he leads 95West's Lidar Department. His main focus is based around aerial lidar, but he has experience with both static and mobile based data as well. His project experience is vast, and has included wide-area 3DEP programs, utility and transportation corridor sites, and small high density asset identification projects.

Miles Strain – 95West Aerial Mapping

Miles is the Aerial Services Manager at 95West Aerial Mapping. Miles earned his Bachelor of Science in Geography with a Cartography Minor from the University of Wisconsin - River Falls. Miles is an ASPRS Certified Photogrammetrist and a Registered Professional Photogrammetrist in the State of Oregon. Miles has over 40 years of experience in the geospatial industry working on projects ranging in size from 10 acres up to Statewide level programs throughout the US. Miles' project experience covers hundreds of corridor projects for State DOT agencies throughout the US, utility corridors, many large- and small-scale mining operations, and a wide range of State and Local Governments. Miles has managed numerous projects utilizing various imagery and Lidar sensors from platforms such as fixed-wing aircraft, helicopter, mobile mapping units, and UAS.

MAPPING UNDERGROUND UTILITIES WITH HIGH ACCURACY GPS AND EM LOCATORS

Presented by Joe Webb

This presentation explores modern workflows for capturing accurate underground utility data by combining GPS/GNSS positioning with electromagnetic (EM) locating tools. Attendees will learn how to move from field detection to actionable GIS data using practical, repeatable methods that fit real-world operations. Topics include integrating EM locate results with high-accuracy GPS, collecting and attributing subsurface features in the field, and publishing the results into a utility GIS for mapping, analysis, and asset management. Whether you're new to underground utility mapping or looking to improve your existing processes, this session provides clear guidance for building reliable, field-ready subsurface datasets.

Joe Webb – Leica Geosystems

Joe Webb is a geospatial professional with 15 years of experience helping organizations improve field data collection across energy, water, stormwater, and electrical distribution. An experienced Esri practitioner, he specializes in ArcGIS Pro, Field Maps, Survey123, Dashboards, and ArcGIS Online. Joe manages GIS sales for Leica Geosystems in the central United States, working with clients to implement high-accuracy GNSS solutions using smart antennas, rugged mobile devices, and modern GIS workflows. He studied

geography and GIS at Texas State University and Penn State, and focuses on delivering practical, scalable solutions that make high-accuracy field data collection more accessible and effective.

MENTAL HEALTH, SUICIDE AWARENESS, AND COMMUNITY SUPPORT

Presented by Dr. Debra Lindh, Ed.D.

This session provides a practical and grounded approach to recognizing and responding to mental health concerns in the workplace and community. Participants will learn to identify green, yellow, and red flags of mental health, understand common barriers to seeking help including stigma and avoidance, and explore actions to support someone experiencing a mental health challenge.

This session will introduce simple, effective check-in actions to support early intervention and connection. Participants will also examine how strengthening a culture of care and psychological safety increases trust, reduces isolation, and supports safer teams and community. This conversation is designed for all levels and everyone who wants practical tools to recognize warning signs, reduce stigma, and step forward with compassion, care, and confidence.

Dr. Debra Lindh, Ed.D. – Minnesota Department of Transportation

Dr. Debra Lindh, EdD, represents the Minnesota Department of Transportation, where she leads enterprise Organizational Health initiatives within complex, high-risk systems. With more than 2 decades of cross-sector experience spanning construction, transportation, infrastructure, and graduate education for our military, law enforcement, and first responders, she specializes in strengthening safety culture through mental health awareness, evidence-based performance integration, and trauma-informed strategy. Her work bridges field operations and administration advancing measurable improvements in workforce mental and emotional wellbeing, psychological safety, incident response, and resilience. Outside of work, Dr. Lindh enjoys baseball, cooking, and is a globally recognized hobby podcaster on PTSD.

MNDOT AS-BUILTS & COLLECTION

Presented by Michelle Pasko

This presentation will focus on the importance of as-builts and the processes involved in their collection within MnDOT projects. As-builts provide accurate documentation of constructed conditions, which is essential for future maintenance, design, and asset management. We will explore what as-builts are, the role of as-builts in Special Provisions, why as-builts are collected and how this data is utilized within MnDOT. Creating an understanding of as-built collection and how as-builts are key to supporting MnDOT's long-term infrastructure goals. By improving as-built collection practices, we can enhance data accuracy, streamline workflows, and ensure better decision-making for Minnesota's transportation network.

Michelle Pasko – Minnesota Department of Transportation

Michelle Pasko is an Asset Management Research Analyst with the Minnesota Department of Transportation, where she supports data-driven decision-making through research and analysis. She brings over nine years of experience working in the civil engineering realm, providing expertise in synthesizing complex information into actionable insights that inform transportation policy and planning. Michelle collaborates with cross-functional teams to ensure research outcomes align with organizational goals and stakeholder needs. A

graduate of North Dakota State University (NDSU), she combines a strong analytical background with a passion for leveraging data to enhance transportation systems and community outcomes. Her work reflects a commitment to accuracy, innovation, and improving public infrastructure through evidence-based strategies.

MNDOT PHOTO AND LIDAR TARGETING GUIDELINES

Presented by Christian Sovak

This presentation will serve to provide updated guidelines for MnDOT district personnel on the various types of aerial photography and lidar targeting requirements. Sections will include UAS, Mobile Lidar, Aerial Photography and Aerial Lidar targeting, including best practices and "what to do" scenarios.

Christian Sovak – Minnesota Department of Transportation

Christian Sovak is an ASPRS Certified Photogrammetrist and Senior Project Manager for the Photogrammetry and Remote Sensing unit under MnDOT's Office of Land Management. He holds a Bachelor of Science in Geography from the University of North Dakota and has been working in the mapping industry for 12 years with the past 3 years in his current role with MnDOT.

NEW NGS 2022 DATUMS (MID-2026) / NATRF/PATRF 2022 AND NAPGD2022

Presented by Bob Green & Steve Richter

This session will begin with a brief overview of traditional measurement equipment technologies. We will then shift our focus to the evolution of geodetic datums and coordinate systems, exploring their historical context, current applications, and future developments. The discussion will emphasize the advantages these systems offer to the surveying, engineering, and GIS communities in Minnesota, particularly regarding the increased accuracy provided by new datum realizations. We will examine the anticipated changes and implications of the upcoming releases of the North American Terrestrial Reference Frame (NATRF) 2022 and the North American Pacific Geopotential Datum (NAPGD) 2022. Finally, we will address forthcoming modifications and enhancements to both office and field software applications, considering their effects on measurement technologies and the profession. Best practices for Base/Rover RTK measurements and Minnesota CORS measurement projects will also be part of our conversation.

Bob Green, PLS – Frontier Precision, Inc.

Bob is a multi-generation land surveyor and geomatics professional with over 43 years of boundary, cadastral, Right-of Way, topographic and geodetic experience. He is a former business owner of a Colorado based Land Surveying and Consulting Firm. Mr. Green is a past 2 term member of The Monitor Panel of the Colorado State Board of Licensure for Architects, Professional Engineers, and Professional Land Surveyors. He also recently completed his last term as a member of the Survey Engineering Industrial Advisory Committee at New Mexico State University. Bob has been a positioning consultant to numerous government agencies including, the US Air Force Space Command Wing, the US Marine Corps, the Department of Defense, US Border Patrol, Army Corps of Engineers, Homeland Security and NASA at White Sands Test Facility. Bob is employed by Frontier Precision as a Geospatial Analyst and is a well-known public speaker and measurement technology advocate. Mr. Green is currently working on several research and development endeavors to streamline and improve functionality to legacy geospatial and drone-based photogrammetry and lidar workflows. Mr. Green's article on Satellite Based Augmentation

was featured in American Surveyor Magazine. <https://amerisurv.com/2021/06/20/are-satellite-based-correction-services-the-next-utility/>

Steve Richter – Frontier Precision, Inc.

Steve Richter is an Executive Vice President for Frontier Precision, Inc. A charter member of the Trimble MGIS Hall of Fame and Trimble Certified Trainer, Mr. Richter started his career in the surveying profession back in 1989, working with CAD products and services while he attended college. Getting into GPS technology in 1991, he has spent the last 34 years specializing in that discipline. With over 18 years focusing on training and support, Steve has been able to provide certified training to Engineering, Surveying and MGIS professionals throughout the Upper Midwest as well as provide technology driven lectures on GPS and Surveying. He currently resides in Minnesota working out of the Maple Grove office for Frontier Precision.

PREPARING FOR THE NEW DATUM

Presented by Geoff Bitner (Biographical Reference: Welcome and Opening Remarks)

Datums and coordinate systems are central to the daily work of surveyors, making it essential to understand the fundamental elements behind them. This presentation will introduce the new datums, North American Terrestrial Reference Frame 2022 (NATRF2022) and North American-Pacific Geopotential Datum of 2022 (NAPGD2022), which are part of NOAA's modernization of the National Spatial Reference System (NSRS). We'll review the current datums, NAD83 and NAVD88, which rely on passive marks in the ground and explain how these will be replaced by a GNSS and geoid-based system. In addition, we'll examine the grid coordinate systems surveyors work in, such as the Minnesota County Coordinate System and its replacement within the State Plane Coordinate System. By exploring these concepts, you'll learn how datums, geoids, and grid systems interact, what changes to expect, and how to prepare for the transition to a dynamic geospatial framework.

RDO EQUIPMENT CORE TECHNOLOGY

Presented by Ava Hanson & Shaun Joy

RDO Equipment Company will be presenting on the Core Technologies that are offered internally and share some of the products and processes that help with productivity in the field and office. We will also be presenting on "Bridging the Gap" and how RDO Equipment can increase productivity from Engineered Design to the finished grade. This will include a discussion on 3D models and how digital surfaces are accurately captured and why this matters!

Ava Hanson – RDO Equipment Company

Ava Hanson is a Government Account Manager. She graduated from Concordia College with a degree in Business-Marketing and Entrepreneurship. She has been with RDO for 2 years.

Shaun Joy – RDO Equipment Company

Shaun Joy is a 3D technology sales specialist at RDO Equipment with over ten years of Industry experience in 3d Modeling, GPS machine control, UAV data collection, 3D Reality Capture and surveying technologies

RECONSTRUCTING THE LINE: A SURVEYOR'S JOURNEY REBUILDING HIGHWAY 5 IN EAST ST. PAUL

Presented by Michael Nelson

This presentation provides a historic perspective on surveying the Highway 5 corridor through Maplewood and East St. Paul, tracing its evolution from a rural highway to an urban street in St. Paul. It will cover the process of building a property base map, conducting a topographic survey, addressing construction considerations, and remonumenting the corridor for future surveyors. Key challenges encountered along the route and the strategies used to overcome them will be highlighted. The discussion will include section corner monuments, notable St. Paul monuments, and the use of historic documents to guide decisions. Finally, we will review the street construction process and examine the complexities of remonumenting section corners, block corners, and property corners to preserve the integrity of this corridor for generations to come.

Michael Nelson – Minnesota Department of Transportation

Michael Nelson is a Licensed Land Surveyor with over 20 years of experience applying advanced geospatial technologies and surveying methodologies in public and private sector projects. He has a strong foundation in geology and land surveying principles, supported by a B.S. in Geology and specialized coursework in Land Surveying and Mapping. In addition, Michael is an expert in boundary retracement, and novice in construction layout, leveraging CAD software and surveying technologies for precision data collection and modeling. He is dedicated to continuous learning and applying technical expertise to deliver innovative, high-quality solutions for complex infrastructure projects.

ROADMAPPING: NOT ROADS BUT GEOSPATIAL SYSTEMS & WORKFLOWS

Presented by Bradford Folta (Biographical Reference: Hostile Workplace: Creating A Data-Friendly Environment Amongst Departmental Silos)

The biggest issue HBA encounters isn't data, isn't budget, isn't wants. It's thinking through the problem. Many organizations have the right idea, but dread having to include other departments or groups because of "more irons in the fire". As a therapist once said, it's best to be mindful of what you have control of and play in your sandbox. This talk will do just that; we will discuss your sandbox. Where the edges are and how to think through your portion and flow the data so it works for you, not the other way around. This way, everyone can see their piece, help influence others, and leverage data for their group's well-being effective with other groups.

SENSOR STACKING AND FUSION WITH YOUR GNSS ROVER

Presented by Roger Shulz

Sensor fusion with a Global Navigation Satellite System (GNSS) combines the absolute positioning of GNSS with the relative motion and environmental data from other sensors to create a more accurate, robust, and reliable navigation system. Sensor stacking, in this context, refers to assembling multiple sensors to work together, which is a prerequisite for sensor fusion. The primary goal of this integration is to overcome the individual weaknesses of each sensor by leveraging their complementary strengths. For example, a GNSS signal can be unreliable in "urban canyons," tunnels, or dense forests, while an Inertial Measurement Unit (IMU) has high accuracy over short periods but accumulates drift over time. By fusing the data, the IMU can bridge gaps in GNSS coverage, and GNSS can periodically correct the IMU's drift.

Roger Shulz – Vertex Unmanned Solutions

With over a decade of experience in the geospatial industry, Roger brings knowledge from a variety of industries including utilities, consulting, mining and exploration, GNSS support and training, and local government GIS coordination. His work centers on geospatial accuracy, data integrity, and practical workflows that support teams at every technical level.

START TO FINISH – STAKING A ROUNDABOUT

Presented by Justin Kraus

In this session we will discuss multiple types of roundabouts, jointing layouts, pavement types, and other features that make almost every roundabout unique. All of these factors will affect the way the layout is completed by the surveyor and preferred deliverables they have for staking.

Justin Kraus – WSB

Justin Kraus, Construction Technology Specialist WSB. Justin has been a leader in advancing the use of many construction technologies that partner both the owner and the contractor. Before joining WSB, Justin was with MnDOT District 7 for 15 years. During his time with MnDOT, he was a Survey Crew Chief, managed survey crews, and modeled construction projects to provide efficiencies and transparency to both the owner and contractor. Justin developed best practices to help surveyors and inspectors work alongside contractors using machine control.

SURVEYOR SAFETY

Presented by Ben Bloom

At this session, common safety and health hazards surveyors encounter in the field will be discussed. These hazards include but are not limited to traffic, ticks, poison ivy, heat stress, and noise. The session will include a review of work practice controls and personal protective equipment that can be used to prevent an injury or illness.

Ben Bloom – Minnesota Department of Transportation

Ben Bloom attended the University of Wisconsin-Stout for Risk Control and has worked in safety since 2006. Ben started with the Minnesota Department of Labor and Industry where he worked as a Safety Investigator and Safety Consultant. While at the Department of Labor, he performed safety inspections and consultative services at general industry and construction worksites. Ben started working for MnDOT in 2017 as Central Office Safety Administrator where he assisted Offices with occupational safety and health. In 2023, Ben started working as MnDOT's Statewide Safety Director.

THE 1890 LAND SURVEY FOR THE TOWN OF ST. LOUIS

Presented by Anthony Lueck

In 1890 the St. Louis Land Improvement Company from Duluth, MN invested in 4 Sections of Land for development along the St. Louis River. They hired Patton & Frank Land Surveyors & Engineering Company to survey and plat this property into the townsite of St. Louis. William Patton and survey crews camped on this site in 1890 and retraced the G.L.O. survey before beginning the subdivision of the town of St. Louis. Details in Field Books of their land survey and subdivision work are presented in reference with a 2016 retracement survey. Also, a variety of historical references & newspaper stories related to the development of the Ghost Town of St. Louis.

Anthony Lueck – North Country Land Survey

Anthony Lueck, Minnesota and Wisconsin Licensed Land Surveyor. High School graduate from Silver Bay, MN. Sociology major from U.M.D. Secondary Land Surveying education from Community Colleges. 10 years survey experience as an Engineering Technician with the U.S. Forest Service in Ely, MN. Worked 10 years as a Survey Technician for St. Louis County in Duluth, MN. Attained Minnesota & Wisconsin Land Survey License in 1999. Land Surveyor for Krech-Ojard Consulting Engineers in Duluth, MN for 8 years. He is currently self-employed at North Country Land Survey in Duluth, MN. Continuing interest in local land survey history of the Minnesota-Wisconsin State Line.

THE 1921 U.S. SUPREME COURT ST. LOUIS RIVER BOUNDARY BETWEEN MINNESOTA AND WISCONSIN

Presented by Anthony Lueck (Biographical Reference: The 1890 Land Survey For The Town Of St. Louis)

In 1921 the U.S. Supreme Court would determine a Boundary Line between Minnesota and Wisconsin in the St. Louis River. Upon completion of Court hearings that began in 1916; a decree was made for the Boundary Line on March, 1920. In October, 1920 the U.S. Court appointed a Boundary Commission to survey the State Boundary Line between the two States along the St. Louis River. That winter a survey was made on the ice of the River to the Courts decree. Land tie monuments along the river serve to perpetuate the State Boundary Line. On June 25, 1921 the U.S. Boundary Commission filed a Report of Survey and Maps to the U.S. Supreme Court. This presentation is a detailed review of the 1921 survey report and maps filed in reference to present retracement work.

TOTAL STATION & PRISM BEST PRACTICES

Presented by Dylan Jones & Weston Schneider

In this session we will dive into the latest in total station technology, specifically highlighting the areas of accuracy and productivity. With the reminder of old, and introduction to new, we will highlight a variety of features & functions that will help you get the most out of your robotic total station.

Dylan Jones – Frontier Precision, Inc.

Dylan Jones has been with the Frontier Precision team since 2014 based out of the Maple Grove, MN office. Frontier Precision offers Sales, Service, Support and Training for the Geospatial industry. Dylan covers the southern Minnesota which includes the Twin Cities metro area for Frontier's geospatial portfolio. He continues to keep up on the latest in hardware & software and industry trends to share this information with his customers.

Weston Schneider – Frontier Precision, Inc.

Weston Schneider is the Northern Minnesota Senior Account Manager for Frontier Precision out of the Waite Park office. He has been with Frontier Precision since 1994 and covering the geospatial industry since 2001. He has provided consulting and field training for the GNSS, Robotics, and Scanning products.

TREES AND NOXIOUS WEEDS: IDENTIFICATION TIPS AND TRICKS

Presented by Christina Basch & Hannibal Hayes

This presentation introduces key principles of tree identification, including leaf arrangement, leaf type, and differences between deciduous and coniferous species. It will highlight common Minnesota trees and shrubs typically found along rights-of-way (ROW). Attendees will learn the basics of identifying noxious weeds, understand legal requirements, and

explore available control methods. The session also addresses safety concerns when working near hazardous vegetation such as poison ivy, wild parsnip, and poison hemlock. Practical tips and strategies will help surveyors identify vegetation effectively while staying safe.

Christina Basch – Minnesota Department of Transportation

Christina is a vegetation management specialist for MnDOT's Office of Environmental Stewardship. She previously worked for the Minnesota Department of Agriculture as a Noxious and Invasive Weed specialist based out of southeast Minnesota. She has a Bachelor's in Applied Science – Biotechnology, and Professional Science Master's in Conservation Biology from the University of Wisconsin – Stout. Christina has been managing and teaching about invasive species around Minnesota for the last 8 years and has extensively worked with high priority noxious weeds in Southern Minnesota.

Hannibal Hayes – Minnesota Department of Transportation

Hannibal Hayes is a new Roadside Vegetation Specialist in the Office of Environmental Stewardship with MnDOT. He has a Bachelors of Science in Horticultural Sciences from the University of Minnesota. Hannibal has 20 years of experience in the green industry, that includes working in retail and research nurseries, the public and private tree care industry and municipal forestry. He holds multiple certifications through the International Society of Arboriculture, including Board Certified Master Arborist, Certified Urban Forest Professional, and Tree Risk Assessment Qualified. He is also a Certified Professional through the Minnesota Nursery and Landscape Association and a MN DNR Licensed Tree Inspector. Hobbies include spending time on his 5 acre hobby farm with his spouse and mother-in-law, growing trees at his family's timber farm and operating his portable sawmill.

TRIMBLE ACCESS – ASK THE EXPERTS

Presented by Tony Edelbrock, Dylan Jones, Wes Schneider, Steve Richter, and Evan Traxler

This session will be a completely open forum related to Trimble Access field software. Come ask questions, offer feedback, and provide feature enhancement recommendations. Frontier Precision and Trimble will have multiple participants ready to take your questions and talking points.

TRIMBLE CONNECT – NEW UPDATES AND BEST PRACTICES

Presented by Tony Edelbrock & Evan Traxler

This presentation provides an overview of Trimble Connect and how the platform continues to evolve to support modern project collaboration. It introduces recent enhancements that improve usability, connectivity, and coordination across teams and disciplines. Attendees will gain insight into general best practices for organizing information, managing project data, and encouraging efficient communication. The session also highlights ways Trimble Connect can be integrated into a variety of workflows, from early design through project delivery. Overall, the presentation aims to help teams get more value from the platform while maintaining flexible and effective collaboration habits.

Tony Edelbrock – Frontier Precision, Inc.

Tony Edelbrock is an Applied Geospatial Engineer for Frontier Precision, Inc. He started his career in 2004 working as a Survey Technician for the Stearns County (MN) Survey Department and in 2016 moved on to become a Senior Survey Technician with the Wright County (MN) Survey Department. He came to Frontier Precision in 2018 and is recognized

as a Level III Certified Survey Technician with the National Society of Professional Surveyors. He provides training and technical support for Frontier Precision covering Minnesota. He currently works out of the Waite Park, MN office.

Evan Traxler – Frontier Precision, Inc.

Evan Traxler is an Applied Geospatial Engineer at Frontier Precision and based out of the Maple Grove, MN office. Prior to Frontier Precision, he was enrolled at South Dakota State University where he obtained his undergraduate degree in Geography and GIS. He then went on to obtain his Master's in Geography from SDSU as well. As an Applied Geospatial Engineer, he works primarily with support and training for both In-Person as well as Virtual/Over-the-Phone at Frontier Precision. Evan supports primarily the southern half of Minnesota, as well as assisting with the rest of the Upper Midwest and Pacific Northwest.

WORKING WITH POINT CLOUD DATA (AERIAL AND GROUND SCANS)

Presented by Luis Rojas (Biographical Reference: Carlson Survey Fundamentals)

In this session, different methods for extracting data from point clouds will be discussed including machine learning based tools and other features including filters, color edges, powerlines, volume calculations, sections and profiles will be shown.

Vendors and Exhibits

95WEST AERIAL MAPPING

95West Aerial Mapping provides aerial acquisition and geospatial services throughout the United States. We are committed to offering unique solutions utilizing cutting edge equipment and delivering services tailored to our clients' needs. 95West became the first geospatial provider in the United States to offer large-format imagery and high-density Lidar solutions to be acquired simultaneously, providing greater accuracy and efficiency for our clients' projects.

Our transportation solutions, from roadways to railways to airports, enable our clients to fast-track project completion without sacrificing accuracy or quality. We regularly support major highway construction projects with transportation departments and engineering firms. We routinely work in large scale mapping solutions, such as high-density lidar and low altitude photogrammetry supported by a highly accurate ground control survey.

95West Aerial Mapping, LLC, is a wholly owned subsidiary of Widseth Smith Nolting and Associates, Inc. (Widseth), a Minnesota corporation. As part of a mid-sized multi-discipline organization, we are able to offer additional services and draw on the resources and staff from our twelve office locations across Minnesota and North Dakota to effectively serve our clients. Visit our website at 95westaerial.com to learn more.

AYRES ASSOCIATES, INC.

With a team of 350+ innovative problem-solvers nationwide, we stand with integrity behind thousands of projects that strengthen communities and our country's infrastructure, economy, and environment.

Clients notice our project managers' ability to translate and transform every detail into actionable, understandable, smoothly coordinated pieces of a successful project. Side-by-

side with our client partners, our project managers serve as the confident, communicative navigators at the helm of each project.

Their tools and expertise include geospatial, civil and municipal engineering, transportation, structural design and inspection, river engineering and water resources, architecture, mechanical/electrical/plumbing engineering, landscape architecture, environmental, planning and development, and telecommunications and SUE.

Contact us today to learn more: 800.666.3103 | www.AyresAssociates.com

CARLSON SOFTWARE

Founded in 1983, Carlson Software, Inc. is a leading provider of office and field software for land development markets, including land surveying, civil engineering, mining, construction, accident reconstruction and GPS-assisted machine control. Carlson Software is headquartered in Maysville, KY, with additional offices in Boston and The Netherlands.

Carlson Software has a goal: to be the premier, independent software provider for the related markets of surveying, civil engineering, mining, and construction. We continue to deliver the most complete suite of software solutions ever offered for these industries by a single company. We believe this is what the industry wants: the best hardware, provided by hardware companies manufacturing GPS, total stations and scanners, and the best application software for all equipment, manufactured by independent, non-aligned software companies focused on ease-of-use, powerful feature sets, technical support and software integration and cross-product compatibility. That's where we come in - Carlson Software offers the complete suite of solutions, across the disciplines of data collection, surveying, engineering design and drafting, mine planning and modeling, construction estimation and machine control. For more information, please contact Luis Rojas at 563-235-7126 or lrojas@carlsonsw.com.

DUNWOODY

Since 1914, Dunwoody has been a place where the curious and the confident have learned by doing. Our focus has always been to educate on the latest technology that is in use in the real-world, so our graduates have the skills employers are looking for. As the only private, not-for-profit technical college in the Upper Midwest, Dunwoody has over 200,000 alumni – many of them now respected industry leaders and entrepreneurs. Today, our graduates enter the workforce with competence, determined to start meaningful and rewarding careers with certificates, associate's, and bachelor's degrees in more than 45 majors.

Dunwoody offers an AAS in Land Surveying and Civil Engineering Technology, a certificate in Land Surveying, and +2 bachelor completion degrees in Business Management and Leadership or Construction Management. For more information on these programs, please email Alex Miller at lmiller@dunwoody.edu or admissions@dunwoody.edu.

FRONTIER PRECISION/TRIMBLE, INC.

Frontier Precision has been a leading supplier of high quality Survey, Mapping, GIS, and Construction Build equipment and supplies since 1989, a Trimble Dealer since 1991. With offices in 11 Midwestern States, Frontier has become one of Trimble's largest volume dealers. Frontier boasts 6 Trimble Certified Service Centers, with 8 Trimble Certified trainers. With one of the most experienced teams in the country, Frontier Precision brings more expertise to the market and the most technologically advanced solutions than anyone

in the area. Frontier proudly represents Trimble, DJI, Spectra Precision, Nikon, and Seco. For more information, please contact Frontier Precision at www.frontierprecision.com or 1-800-944-8557.

LEICA GEOSYSTEMS, INC.

Our 200 years of passion for surveying demonstrate our ability to deliver precise and accurate instruments, sophisticated software, and trusted services to those shaping the future of our world. Leica Geosystems' pioneers and visionaries have shaped the history of surveying. Over the last two centuries, our company, in its various forms, has continuously delivered world's first innovations, maintaining surveying innovation leadership. From the evolution of theodolites to total stations, and even the miniaturization of laser scanners for practical everyday use, all our innovations aim to increase productivity, improve workflows, and provide richer valuable deliverables. www.leica-geosystems.com. Please contact Dan Forsberg at 612-385-6067 or email him at dan.forsberg@leica-geosystems.com for more information.

MARTINEZ GEOSPATIAL, INC.

Martinez Geospatial, Inc. provides Photogrammetry & Orthophotography, Land Surveying, High-Definition Static Laser Scanning (HDS), Mobile LiDAR (Light Detection and Ranging), Simultaneous Localization and Mapping (SLAM), Small Unmanned Aircraft Systems (sUAS), three-dimensional (3-D) Spatial Modeling/Building Information Modeling (BIM), Rendering & Visualization, and Aviation Consulting services for public and private clients nationwide. Founded in 1974, Martinez Geospatial has built an industry-wide reputation as an expert in gathering, understanding, and delivering high-quality geospatial data through the use of many different methods. Whether utilizing ground-based imagery; aerial imagery from a fixed-wing aircraft, rotorcraft, or drone; airborne, mobile terrestrial, or static terrestrial LiDAR; global navigation satellite systems (GNSS); and/or traditional survey methods, Martinez Geospatial takes tremendous pride in developing innovative geospatial solutions tailored to the specific, unique requirements of each individual project.

MINNESOTA DEPARTMENT OF TRANSPORTATION – RECRUITMENT OFFICE

At the Minnesota Department of Transportation, we strive to find talented employees with innovative ideas to advance Minnesota's nationally recognized transportation system. A MnDOT recruiter will be available to discuss job opportunities in the surveying field. Services provided will include education about MnDOT jobs, resume review, tips and tricks for applying to State jobs, and discussion about your career goals. Please stop by our display to find out more about what MnDOT has to offer or contact us at jobs.dot@state.mn.us.

MINNESOTA DEPARTMENT OF TRANSPORTATION – ORGANIZATIONAL HEALTH

At the Minnesota Department of Transportation, we strive to support whole person wellbeing. When we say "safety first, safety always," that safety includes mental health, emotional wellbeing, and psychological safety. Dr. Deb Lindh, EdD, will be available for 1:1 conversations during the conference as well as at the Organizational Health booth to share an overview of services that include emotional wellbeing and mental health support, suicide awareness and prevention, critical incident response, post incident support, and individual and team development.

With more than 50 program offerings, from mindfulness based stress reduction to finding calm during uncertain times, along with a variety of lunch and learn sessions, MnDOT's Organizational Health provides a robust portfolio of resources designed to strengthen resilience and foster healthy teams across the agency.

Dr. Deb will be available for meetings in conference room Heartland 3 at Breezy Point outside of the workshop breaks.

RDO EQUIPMENT CO.

Founded in 1968, RDO Equipment Co. sells and supports intelligently connected agriculture, construction, environmental, irrigation, positioning, and surveying equipment from leading manufacturers, including John Deere, Vermeer, and Topcon. RDO has a presence here to support the Surveying and Mapping equipment for the Geospatial markets focusing on construction related workflows.

TOPODOT

TopoDOT Solutions offers products and services designed to maximize the value of geospatial point cloud data across all operations active in the surveying, planning, design, engineering, construction and maintenance of the world's transportation and civil infrastructure. Our TopoDOT software application achieves the industry's highest levels of productivity and quality in every aspect of the digital twin production process. Our TopoShare process offers the industry's most effective solution to geospatial data governance at the lowest possible cost. And TopoDOT Consulting Services supports our user community in implementing these processes within their operations to ensure the highest levels of productivity, quality and efficiency.

VERTEX UNMANNED SOLUTIONS

Vertex Unmanned Solutions is a UAS solutions provider specializing in program design, aircraft and payload procurement, integration, and mission support. We help clients standardize operations, train crews, and scale across teams—whether the mission is inspection, mapping, public safety, or infrastructure assessment. Our approach is consultative and outcomes-driven: the right platform, the right workflow, and the right support to keep operations running.

WHIRRX

Whirrx provides post-processing for ANY Drone System which enables a surveyor to fly their own surveys, with their drone of choice, and receive a digital survey deliverable with ground verifiable accuracy of 1 - 1.5 cm (less than 0.06ft) on hard surfaces. This enables anyone to achieve the same accuracy as traditional topographic surveys with better resolution, less interpolation, and a superior aerial image deliverable. Whirrx partners with you from start to finish, to rapidly deliver a 3D model and Aerial of the site flown. For more information, please contact Steve Zeets at: Steve@Whirrx.com.

MEAL MENUS DURING WORKSHOP

Tuesday, March 24

Lunch: "Tex Mex Buffet"

Dinner: "Deluxe Dinner Buffet"
(BBQ Ribs, Roast Turkey & Gravy, and Wild Rice Polenta with Ratatouille)

Wednesday, March 25

Breakfast: "Buffet Style"

Lunch: "Asian Buffet"

Dinner: "Deluxe Dinner Buffett"
(Chicken Linguine, Pollack Filets, and Butternut Squash Risotto)

Thursday, March 26

Breakfast: "Buffet Style"

- ***Breakfast will be served in the Marina Dining Room***
- ***Breaks, Lunch, and Dinners will be served in the Minnesota Rooms!***

WEBSITE ADDRESSES FOR YOUR INFORMATION

Minnesota Department of Transportation, Office of Land Management –
<http://www.dot.state.mn.us/landmanagement/>

MnDOT's Geodetics – <http://www.dot.state.mn.us/surveying/geodetics/index.html>

MnDOT GIS Right of Way Mapping – <http://www.dot.state.mn.us/surveying/mapping.html>

MnDOT CORS/GNSS Network – <http://mncors.dot.state.mn.us/Map/SensorMap.aspx>

MnDOT Right of Way & Survey Workshops Training –
<http://www.dot.state.mn.us/landmanagement/calendar.html>

MnDOT Software Applications and Technical Resources –
<http://www.dot.state.mn.us/surveying/toolstech/index.html>

MnDOT Photogrammetric & Remote Sensing –
<http://www.dot.state.mn.us/surveying/photogrammetrics.html>

Federal Highway Administration – <http://highways.dot.gov/>

International Right of Way Association – <https://www.irwaonline.org/>

Minnesota Association of County Surveyors – <http://www.macsinfo.org/>

Minnesota Society of Professional Surveyors – <http://www.mnsurveyor.com/>

National Geodetic Survey – <http://www.ngs.noaa.gov/>

National Highway Institute – <https://highways.dot.gov/nhi/home>

The Minnesota Secretary of State – <https://www.sos.mn.gov/>

The Minnesota State Legislature – <https://www.leg.mn.gov/>

US Coast Guard Navigation Center – <http://www.navcen.uscg.gov/>



WORKSHOP NOTES