AGENDA 20-23 JUNE 2022

MONDAY, JUNE 20th

5:00 PM	Registration	
5:30 PM	General Session /Opening Keynote	
7:30 PM	Welcome Reception in the Zone	

Hexagon GEO Public Safety & Forensics Presentations
- Connected Cities Summit -

TUESDAY, JUNE 21st

7:00 AM	Breakfast	
8:00 AM	Conference Keynote	
9:00 AM	Zone Break	
10:00 AM	Room: 2301 A	**Crash and Crime Scenes Investigation and Reconstruction – Technologies Applied** *Ivan Macella BEng. ACTAR	Crash and Crime Reconstruction Expert	Expert Witness at the Court of Malta	Former police officer in Calabria	Italy* *Generale Dott. Luciano Garofano	Former Commander of the Carabinieri Scientific Investigations Center	Expert in DNA analysis and BPA	Italy*
11:00 AM	Room: 2301 A	**Evolution of 3D Scanning for Forensic Mapping of Crime Scenes at York Regional Police** *Brad Joice |Inspector Special Investigations & Support |York Regional Police |Canada*
11:30 AM	Room: 2301 A	**How KNOTT Laboratory Reconstructed the National Spotlight Race Accident of NASCAR Legend Tony Stewart with Laser Scan Data and Video Footage** *Stanley C. Stoll	M.Eng.	D.F.E.	CFEI	CVFI	Combat Engineer and Explosives Expert US. Army	CEO – P.E. KNOTT Laboratory	US*
12:00 PM	Zone Open / Lunch	
1:30 PM	Room: 2301 A	**How Ontario's Emergency Preparedness Response Unit at the Office of the Fire Marshal deploys Reality Capture and 3D Laser Scanning for Investigations of Serious Fires** *Brent Sterling	Emergency Response Specialist	Office of the Fire Marshal	Canada*
2:00 PM	Room: 2301 A	**Shooting Incident Reconstruction Using Map360 - Verification and Measurement Uncertainty Study** *Paul I. Stockdell	CCSI Crime Scene Investigator	Johnson County Sheriff's Office Criminalistics Laboratory	US*
2:30 PM	Zone Break	
3:30 PM	Room: 2301 A	**How the Changing Political Landscape of 2020 Enabled the Portland Police Bureau to Justify and Procure the Laser Scanner RTC360 and Replace the ScanStation C10** *Jeffrey Shearer	Criminalist & Jamin Becker	Criminalist	Portland Police Bureau	US*
4:00 PM	Room: 2301 A	**Bridging the Past to the Present: Solving Key Issues in a Collision Reconstruction When the Environment Has Been Changed** *Edmund A. Kozin	CEO Legal Depiction	Emmy Award-winning expert in visual accident reconstruction and re-creation	Canada*
4:30 PM	Summit Keynote	
5:30 PM	Break	
6:00 PM	Reception	

Hexagon GEO Public Safety & Forensics Trainings
- Pure Surveying Summit -

WEDNESDAY, JUNE 22nd

7:00 AM	Breakfast			
8:00 AM	Room: Titian 2205	**Creating Rapid Investigative and Pre-Trial Forensic Deliverables** *Ken Jones | Leica US*		
8:45 AM	Zone Break			
10:00 AM	Room: Titian 2205	**Map360 Fundamentals** *Ken Jones | Leica US*		
10:45 AM	Room: Titian 2205	**Map360 Point Cloud Tools** *Karen Hughes| Leica US*		
12:00 PM	Zone Open / Lunch			
1:30 PM	Room: Titian 2205	**Merging Total Station, GNSS, Drone, RTC360 and BLK360 Data in Map360** *Karen Hughes and Ken Jones | Leica US*		
2:30 PM	Zone Break			
3:30 PM	Room: Titian 2204	**Merging Total Station, GNSS, Drone, and Laser Scan Data in Infinity. Parts 1 & 2** *Tim Kerr | Senior Support Engineer - S&E | Hexagon*		
5:30 PM	Break			
7:30 PM	Evening Event			

Hexagon GEO Sessions of Interest
- Pure Surveying Summit -

THURSDAY, JUNE 23rd

7:00 AM	Breakfast			
8:00 AM	Room: Titian 2204	**Introduction to Infinity** *Pierre Labe| Hexagon*	Room: Titian 2206	**Introduction to HxDR** *Rick Johnston | Hexagon*
9:00 AM	Zone Break			
11:00 AM	Room: Titian 2204	**UAV Image Processing in Leica Infinity Office Software** *Tim Kerr | Senior Support Engineer - S&E | Hexagon*		
12:00 PM	Zone Open / Lunch			

Public Safety & Forensics Presentations - Abstracts

TUESDAY, JUNE 21st

10:00 AM |Crash and Crime Scenes Investigation and Reconstruction– Technologies Applied

Ivan Macella BEng. ACTAR | Generale Dott. Luciano Garofano | Italy

Crash and crime scenes are generally characterized by the presence of an indefinite and unpredictable number of pieces of evidence, debris, damaged vehicles, sometimes blood spatter. Professional investigators and reconstructionists, or any other Public Safety persona interested in explaining and reconstructing "what has happened" at a scene, need to collect and document all the evidence in the shortest time possible, operating in safety conditions and maintaining the chain of custody.

Leica Geosystems provides a "complete investigation toolbox" of solutions that represent the industry standard for Public Safety professionals: law enforcement officers, accident reconstructionists, crime investigators, blood spatter analysts and other forensic experts.

No piece of evidence left behind and unseen!
A complete and easy workflow from the scene's forensic mapping using Leica Geosystem's state-of-the-art hardware to a professional 2D or 3D deliverable using Leica's software.

11:00 AM | Evolution of 3D Scanning for Forensic Mapping of Crime Scenes at York Regional Police

Brad Joice |Inspector Special Investigations & Support |York Regional Police |Ontario Canada

Inspector Brad Joice in the Bureau Commander of Special Investigations & Support, York Regional Police in Ontario, Canada. Brad has over 32 years of police experience, with 10 years experience as a Collision Investigator/Reconstructionist and 20 years experience as a Forensic Investigator. Brad has been using electronic sensors to assist with mapping collision & crime scenes since 1997. These sensors include total stations, Leica Distos and Leica HDS Scanners, combined with Map360 (formally MapScenes) Forensic CAD and Evidence Recorder software. Brad is a Leica HDS and Map360 Certified Trainer and has trained students across North America, South Africa, Hong Kong, South Korea and the United Kingdom.

York Regional Police (YRP) started exploring the 3D Scanner world in 2010, working on a research project with the University of Toronto. At that time, it was the Leica ScanStation 2 that was an instrument of choice. In 2014 YRP purchased their first scanner, a Leica P20. Fast forward to 2022 and we have added two RTC360, a BLK360 and a BLK3D to our forensic mapping arsenal.

Every crime scene is different and as such the equipment used to properly measure the scene varies. Most of our scenes are now mapped using several different tools/sensors and the resulting data is then combined into a court presentation.
I will discuss the journey that YRP embarked upon and the transition of Cyclone to Register 360, P20 to the RTC360 and where does the BLK360 & BLK3D fit into our mapping processes. We will also go through the evolution of Map360 and TruView while discussing court ready deliverables and their acceptance by our courts.

Case examples will be discussed relating to the scanning of shooting scenes for trajectory analysis. I will also share lessons learned and the preparation of trajectory cones in Map360 and TrueView.

11:30 AM | How KNOTT Laboratory Reconstructed the National Spotlight Race Accident of NASCAR Legend Tony Stewart with Laser Scan Data and Video Footage

Stanley C. Stoll |M.Eng. |D.F.E. National Academy of Forensic Engineers | Combat Engineer and Explosives Expert US. Army | Certified Fire and Explosion Investigator (CFEI) | Certified Vehicle Fire Investigator (CVFI) | CEO - Principal Engineer KNOTT Laboratory

Knott Laboratory provides Forensic Engineering and Animation with expertise in Mechanical, Civil, and Structural Engineering cases. Knott laboratory engineers, accident reconstructionists, and animators have worked on over 20,000 cases nationwide. As an example, On August 9th, 2014, NASCAR legend Tony Stewart was racing in a Sprint Car Series event in Canandaigua, NY. During the highly competitive race, Stewart attempted to overtake a fellow racer, Kevin Ward Jr., whose car ended up in the wall. After exiting his vehicle, he was struck by Stewart's car under a yellow caution flag, resulting in the death of Mr. Ward. The case was in the national spotlight, and Knott Laboratory was contracted to reconstruct the event. Their engineers and animators used laser scan data and video footage to reconstruct the event with scientific accuracy. The laser scan data allowed them to apply techniques known as videogrammetry and matchmoving, to provide otherwise unavailable views and analysis of the collision. Their findings proved to be pivotal for the civil case and are the subject of an upcoming documentary on the incident.

Knott Laboratory also combines its engineering expertise with technology to create structural assessments of historical buildings for safety and preservation issues, as well as in construction litigation and failure analysis. This ensures that if things go wrong, the cause is determined through scientific reason. Through both accident reconstruction and structural analysis, the use of laser scan data allows engineers to make accurate measurements and conduct a level of analysis previously unseen in the industry.

Knott Laboratory's presentation will showcase examples of the Tony Stewart racing accident and the structural analysis of a historical church. In both cases, you will see how laser scan data and analysis technology led to stunning conclusions.

Public Safety & Forensics Presentations - Abstracts

TUESDAY, JUNE 21st

1:30 PM | How Ontario's Emergency Preparedness Response Unit at the Office of the Fire Marshal deploys Reality Capture and 3D Laser Scanning for Investigations of Serious Fires

Brent Sterling | Emergency Response Specialist | Office of the Fire Marshal |Ontario, Canada

Brent Sterling is an Emergency Response Specialist in the Emergency Preparedness and Response Unit with the Office of the Fire Marshal (OFM), a part of the Ministry of the Solicitor General. Brent Has 30 years of experience in emergency services.
The OFM working under Fire Protection & Prevention Act 1997, investigates approximately 600 fires and explosions a year. Last year we investigated over 120 Fatal Fires in Ontario. The OFM also provides / coordinates such services as Urban Search & Rescue (USAR), HAZMAT/CBRNE response, and investigate or assist in the investigations of other incidents such as Drug labs & Grow Ops.
Brent will present how OFM has quickly added 3D laser scanning to their toolkit deployed at investigations across the province of Ontario. This will cover some innovative approaches to using the RTC360 scanners and how this technology helps fully document serious fire scenes as they are delayered. Typical scenes frequently involve 100 or more setups and are conducted in a broad range of environmental conditions. This critical information is then used to help investigators as they conduct their analysis.

2:00 PM | Shooting Incident Reconstruction Using Map360 - Verification and Measurement Uncertainty Study

Paul I. Stockdell |CCSI Crime Scene Investigator |Johnson County Sheriff's Office Criminalistics Laboratory | Olathe, Kansas, United States

The Johnson County Sheriff's Office Criminalistics Laboratory Crime Scene Investigations Unit regularly utilizes a laser scanner, currently the Leica RTC360, to document scenes such as homicides, arsons, injury/noninjury shootings, officer-involved shootings, suspicious/unattended deaths, and vehicle accidents.
The CSI Unit is also working on a county building scanning project and recently had the opportunity to travel to Washington D.C. to assist Leica Representatives scan the National Law Enforcement Officer Museum and the Fallen Officer Memorial. The JCSO crime lab is an accredited forensic science testing laboratory currently accredited to the ISO/IEC 17025:2017 requirements. Per these requirements, new software used to assist with analysis must go through a verification process and measurement uncertainty needs to be evaluated for all reported quantitative results.
The CSI unit recently completed a two-step process to verify that the Leica Map360 program could be used for shooting incident reconstruction purposes and a measurement uncertainty evaluation to report numbers obtained during analysis. A close look into each of these processes, the methods used, and the results obtained will be the main emphasis of the discussion.

3:30 PM | Real-Time, Real-World Conditions Impact Operations, Funding, and Procurement for Public Safety Customers: How the Changing Political Landscape of 2020 Enabled the Portland Police Bureau to Justify and Procure the Laser Scanner RTC360 and Replace the ScanStation C10

Jeffrey Shearer |Criminalist | Portland Police Bureau |Oregon, United States
Jamin Becker| Criminalist | Portland Police Bureau |Oregon, United States

The Leica ScanStation C10 was nearing its end of supported work-life and the Portland Police Bureau (PPB) was seeking procurement of a Leica RTC360 to update their Crime Scene Investigation (CSI) response in both speed and in-field interactivity. PPB CSI explored funding options for an RTC360 that was being met with roadblocks due to tighter budgets and strained police resources, as calls to "Defund the Police" were being made. Portland, OR was a hotbed for political action and public protests during this era. The ScanStation C10 was deployed at an Officer-Involved Shooting (OIS) during the time of protests and the political crisis surrounding and following the summer of 2020. The lengthy scan times and extended time on-site blatantly demonstrated the immediate need for a faster scanner. After initially being declined by the city's financial managers, officer safety concerns stemming from this OIS scene served as the primary driving factor leading to the approval to proceed with the procurement of the RTC360. The process had more layers of complexity, which will be explored in this session, as well as the process of adopting the RTC360 into operation, aspects of laser scanning in Portland, OR as impacted by the political climate of 2020, and general lessons learned over the first year of scanning with the new system.

2:00 PM | Bridging the Past to the Present: Solving Key Issues in a Collision Reconstruction When the Environment Has Been Changed

Edmund A. Kozin | CEO Legal Depiction | Emmy Award-winning expert in visual accident reconstruction and re-creation | Burbank, Canada

Forensic analysis can use data from a myriad of sources. This case involved a vehicle that went off the roadway and into a ravine causing a fire that spread to a bridge adjacent to the site of the accident. This presentation will discuss how 3D laser scanning helped "Bridge the Gap" between traditional methods of surveying and the value added by High-Definition Surveying and Reality Capture to solve for the speed and location of a vehicle throughout a collision event, while providing data that allows for reconstruction despite the drastically changed environment, from pre-crash to post-crash conditions. The data collected was used to overlay imagery captured by security camera footage, and the question of whether an extended guardrail could have prevented this accident from occurring is sought to be answered in this reconstruction and revealed in this presentation.

Public Safety & Forensics Training Descriptions

WEDNESDAY, JUNE 22nd

8:00 AM | Creating Rapid Investigative and Pre-Trial Forensic Deliverables

Ken Jones | Leica US

Creating accurate and consumable deliverables for cases and court is extremely important. This class will focus on creating rapid investigative and pre-trial deliverables. Utilizing the limit boxes to create views and geotags to mark evidence with linked pictures and videos in Cyclone REGISTER 360 creates the foundation for presentations. Further tools in Map360 such as trajectory rods or witness viewpoints finalize the presentations. Other forensic deliverables such as DXF 2D export into Map 360, ortho TIFFs and the overlay of OBJ/IFC models with point clouds will also be explored.

10:00 AM | Map360 Fundamentals

Ken Jones | Leica US

Map360 is an innovative and versatile tool for creating 2D and 3D forensic deliverables. This class introduces users to the program interface, walks through how to create a scene and set up drawing units, as well as general settings and navigation. Users will also learn how to bring in an Ortho TIFF, and use basic drawing commands including layers, snaps, lines, polylines, arcs and circles, grips and selections, body poser, symbols, text and dimensions. The class will end with learning how to organize and print a deliverable.

10:45 AM | Map360 Point Cloud Tools

Karen Hughes| Leica US

Working with point cloud data in Map360 is easy and efficient. This class explores how to work with point clouds in 3D and maximize the point cloud toolset. Aligning the point cloud using the UCS tools makes it easy to clean data, create clips, sections and isolate areas of interest to create deliverables. This class will show how to maximize the tools in Map360 to use point clouds to create both 2D and 3D exhibits.

1:30 PM | Merging Total Station, GNSS, Drone, RTC360 and BLK360 data in Map360

Karen Hughes and Ken Jones | Leica US

All roads lead to Map360 with its ability to integrate data from multiple sensors. This course will show how to import data and overlap data from one project incorporating a total station, GPS/GNSS receiver, drone, RTC360 laser scanner and BLK360 laser scanner. Data from different sources highlights important features about a crime scene or crash. Users will learn how to work with the data and create accurate and compelling deliverables for court.

3:30 PM | Merging Total Station, GNSS, Drone, and Laser Scan data in Infinity. Parts 1 & 2

Tim Kerr | Senior Support Engineer - S&E | Hexagon

One of the most powerful capabilities of Infinity office software is its ability to seamlessly merge data from multiple sensors, including total stations, GNSS receivers, drones and laser scanners, for easy QA/QC and export into your CAD software. This class will give you an understanding of the tools available in Infinity to import and handle both traditional and non-traditional survey datasets. You'll also learn how to align point cloud data to a projected coordinate system and explore the workflow to migrate data to CAD applications for high-value deliverable creation.

Sessions of Interest

THURSDAY, JUNE 23rd

8:00 AM | Introduction to Infinity

Pierre Labe | Hexagon

Manage, process, combine, analyze, quality check and share all your survey data from total stations, digital levels, GNSS systems and UAVs in one software, Infinity. This software makes combining different data seamlessly.

Infinity helps you to connect through integrated data exchange services to move data more efficiently. In this introductory class, users will be introduced to the overall Infinity application structure, project creation and settings, and how to import and visualize data.

This class is applicable for all segments including plant, survey, building and construction, and public safety & forensics.

8:00 AM | Introduction to HxDR

Rick Johnston | Hexagon

HxDR is Hexagon's cloud-based storage, visualization and collaboration platform for reality capture and geospatial data.

Upload data and access it from anywhere and share it with colleagues and clients worldwide. Data can be uploaded for cloud storage, viewing, sharing and collaborating directly from the field from any compatible device. HxDR will automatically convert uploaded point clouds into colorized textured 3D meshes.

All your 3D assets are viewable including point clouds, colorized textured meshes and panoramic images within various supported web browsers on any device. This session will introduce the HxDR web-based platform and highlight how it can be utilized to improve your project needs.

This session is applicable to all segments including plant, survey, building construction and public safety & forensics.

11:00 AM | UAV Image Processing in Leica Infinity Office Software

Tim Kerr | Senior Support Engineer - S&E | Hexagon

HxDR is Hexagon's cloud-based storage, visualization and collaboration platform for reality capture and geospatial data. Upload data and access it from anywhere and share it with colleagues and clients worldwide.

Data can be uploaded for cloud storage or directly from the field from the BLK2GO, BLK2FLY and BLK ARC.

HxDR will automatically convert uploaded point clouds into textured 3D meshes. All your 3D assets are viewable including point clouds, textured meshes and panoramic images. This session will introduce the HxDR web-based platform and highlight how it can be utilized to improve your project needs.

This session is applicable to all segments including plant, survey, building construction and public safety & forensics.