Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 28

Room: B130

Surveying for New Technologies

Organizer: Rachel Lewis

Moderator: Rachel Lewis

Moving People & Goods, Mapping to Support Connected & Autonomous Vehicles

John Sullivan, Continetnal Mapping, Sun Prairie, WI

A critical component to all autonomous vehicles is the base map they use for both critical and referential navigation. Continental Mapping will share its work in the development of HD Base Maps to support the autonomous market through its involvement in the Wisconsin Proving Grounds, Michigan's MCity & Beyond. We will define mapping standards to meet industry needs, how data is being collected & utilized, and methods for evaluating the quality of geospatial data.

Technological Advances in Subsurface Utility Engineering

Bryan Teschke, Cardno, Inc., Cranberry Twp., PA

James Anspach, Cardno, Inc., Bend, OR

Advances in technology and practice regarding Utility Engineering & Surveying are continuing to change the way utilities and other underground structures are investigated, discovered, and mapped for highway design. This presentation focuses on the use of multi-channel ground penetrating radar and multi-channel time-domain electromagnetic imaging technologies in highway & transportation applications that are currently being studied by the FHWA through SHRP2 grants in several state DOTs.

Mapping-The Digital Underground, The Future of 3D Subsurface

Kevin Conlon, Surveying and Mapping, LLC, Raleigh, NC

This project demonstrates the innovative use of existing technology to solve problems, and how cutting edge technology enables us to depict & explain geospatial data realistically. It points to future trends of using virtual reality and immersive site visits without actually being there. Utilizing standard and innovative data collection and reduction, SAM delivered smarter collaboration for SCDOT to share data anywhere, anytime, on any device.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 29

Room: A120-122

Building New Structures for Future Mobility

Organizer: Kenneth Ishmael

Moderator: Kenneth Ishmael

A Stronger Span: Perspectives on Ohio's Longest County Route Semi-Integral Bridge

Mike Killian, Burgess & Niple, Inc., Columbus, OH

Cornell Robertson, Franklin County Engineer, Columbus, OH

Kevin Gothberg, Kokosing Construction Company, Inc., Westerville, OH

This presentation will cover the owner, designer, and contractor perspectives for the replacement of the Smothers Road Bridge over Hoover Reservoir in Franklin County, OH. The project was successfully completed within a tight time frame and under budgeted cost.

SR-513 over I-70: Curves, Trucks, and Buggies

Tom Less, Woolpert, Columbus, OH

SR-513 crosses IR-70 in ODOT's District 5 and has unique complexity in geometry, interstate ramps, and local route. All elements of the project process from beginning of design through completion will be discussed.

New Means and Methods for Bridge Overhang Construction

Gary Dinmore, Dinmore Engineering PLLC, Upper Black Eddy, PA

John Deerkoski, John S. Deerkoski, P.E. and Associates, Warwick, NY

Currently in use at the LaGuardia Airport Mega-Project, a new method of bridge overhang construction will be shown in conjunction with slip-form construction of the bridge barrier. Work is completed in its entirety from the top side and proceeds at an accelerated rate benefitting construction schedule while providing safety benefits as well.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 30

Room: A223-225

More Than Just Historic Bridges--What's New in Cultural Resources

Organizer: Erica Schneider

Moderator: Erica Schneider

Section 106 Consultation, Public Education, and the Transportation Engineering Process: A Case Study from Henry County, Ohio

Robert Chidester, The Mannik & Smith Group, Inc., Maumee, OH

In 2013, The Mannik & Smith Group, Inc. began working on the design of a new bridge over the Maumee River in Napoleon, Ohio for the Henry County Transportation Improvement District. Almost immediately, archaeological site 33HY0167 (first investigated by academic archaeologists in 1980) was identified as a potential environmental red flag for the Preferred Alternative bridge location. Over the course of 4 1/2 years and multiple phases of investigation, MSG's archaeologists assisted the HCTID in navigating the NEPA process and engaging multiple stakeholders regarding the impacts to 33HY0167 from construction of the bridge. These efforts culminated in full-scale data recovery archaeological excavations of a portion of the site in the Spring of 2018. This presentation will provide an overview of the various stages of archaeological investigation at the site and how they fit into ODOT's NEPA/Categorical Exclusion process, as well as the importance of public education in archaeological mitigation strategies.

Bridging the Gap: How Partnering Built Consensus and Streamlined the Cultural Resource & Section 4(f) Processes on the Western Hills Viaduct Project

Scott Brown, Ohio DOT, Lebanon, OH

Susan Gasbarro, Ohio DOT, Columbus, OH

This session will explore how working closely with local officials, agencies, and consulting parties allowed ODOT to navigate and complete the Section 106 and Section 4(f) processes quickly despite complex impacts to historic properties.

Ohio's Historic Bridge Update: Innovation and Technological Advances from the Groovy '60s

Christina Slattery, Mead & Hunt, Inc., Middleton, WI

ODOT in currently updating the Ohio Historic Bridge Inventory to include bridges built between 1961 and 1975. Yes, bridges of this era have surpassed or are approaching the historic threshold (50 years old)! This session will discuss what technological innovations were occurring during this period and ODOT's contemporary bridges that are and are not eligible for listing on the National Register of Historic Places.

Session: 31

Room: B243-245

WTS Presents Strategic Partnerships

Organizer: Joy Lanham

Moderator: Marie Keister

Strategic Partnerships

Aslyne Rodriguez, EmpowerBus, Columbus, OH

Traci Luers, Ohio DOT, Columbus, OH

Thea Walsh, MORPC, Columbus, OH

Strong partnerships are critical to almost any great success story. Yet, when you or your agency or company encounter a major opportunity it's generally not the most opportune time to develop the relationships needed to capitalize on it. This session will highlight strategies and tools leaders can use to form strong partnerships.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 32

Room: A210-212

The Ups and Downs of Retaining Walls

Organizer: Bethanie Meek

Moderator: Bethanie Meek

Stability Considerations for Tie-Back Retaining Walls

Timothy Stark, University of Illinois, Urbana, IL

Alexander Dettloff, Ohio DOT, Columbus, OH

Considering the case history of a recently failed retaining wall, this presentation will discuss various design scenarios for which a tied-back soldier pile and lagging wall should be designed.

Design and Construction Issues of a 2 Wall System Beneath SR 7 RR Bridge in Steubenville, OH (JEF-7-17.29)

Mark Stouffer, JMT, Columbus, OH

Zachary Evick, Ohio DOT, New Philadelphia, OH

This presentation will focus on the design of the two walls beneath the bridge, as well as the numerous lessons learned in dealing with the RR company.

Case Study of a Failed Tied-Back Retaining Wall in a Colluvium Slope Under Landslide Conditions

Craig Lee, S&ME, Inc., Lexington, KY

The presentation discusses a wall for a Gypsum Storage Building in northern KY and focuses on the unique challenges of the geologic setting at the site, the shortcomings of the design phase geotechnical exploration, the importance of identifying landslide geometry when assigning design wall loads, the value of an adequate site visit, the importance of verifying the anchors are indeed into the target material and not just drilled to a set length and a discussion on what happened and how it was addressed.

Session: 33

Room: A123-125

Environmental Hydrology and Hydraulics

Organizer: Becky Humphreys

Moderator: Jon Prier

Catch Basin Inserts for Stormwater Treatment

Jon Prier, Ohio DOT, Columbus, OH

Mark McCabe, Gresham Smith & Partners, Columbus, OH

ODOT has funded a research project to conduct full-scale laboratory testing of various catch basin insert products as well as field testing of the same products on ODOT roadways. The research has assessed pollutant removal capabilities of the products based on testing consistent with Ohio EPA and ODOT standards. The research also assessed potential maintenance considerations associated with regular O&M of the catch basin inserts by closely monitoring installations in the field. This presentation will summarize the findings of the research considering pollutant removal performance, maintenance level of effort, and potential applicability of catch basin inserts for meeting post-construction stormwater treatment requirements.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 34

Room: A226

Safety Routes to ….Everywhere!!!

Organizer: Jordan Whisler

Moderator: Cait Harley

Statewide Resources for Bicycle and Pedestrian Planning

Cait Harley, Ohio DOT, Columbus, OH

Jordan Whisler, Ohio DOT, Columbus, OH

ODOT will share about the evolution from SRTS to overarching bicycle and pedestrian planning and implementation. Hear about activities and resources available to advance walking and biking through statewide planning, performance management, program funding, and the development of this work over time.

School Travel Plan Development: Beyond the Schools

David Shipps, Toole Design Group, Columbus, OH

Hear about the evolution from SRTS to safe routes to everywhere through the development of School Travel Plans and Active Transportation Plans. Hear about the role of consultants in supporting communities in local bicycle and pedestrian planning efforts.

Regional Transportation Safety: It's More Than Just Crash Data!

Kate Moening, NOACA, Cleveland, OH

Learn about how one metropolitan planning organization is elevating transportation safety in local communities through resources, technical assistance, coalition building, and more!

Local Strategies for Supporting Safe Routes to Everywhere

Katie Swidarski, Columbus Public Health, Columbus, OH

Hear a local example of SRTS project implementation in Columbus, Ohio and how local program delivery is supporting safe routes to everywhere…

Session: 35

Room: B240-242

Pavement Management

Organizer: Aric Morse

Moderator: Patrick Bierl

Development of a Pavement Management Information System for the City of Toledo

Abbas Butt, Engineering & Research International, Inc, Savoy, IL

Presentation discusses the use of mobile mapping technology with both ODOT PCR and MicroPAVER distress collection.

Ever Driven Every Mile of Street in Cleveland? We Have!

Derek Johnson, Michael Baker International, Cleveland, OH

Isaac Khoury, City of Cleveland, Cleveland, OH

Cleveland's approach to pavement condition surveys and pavement management for development of an annual resurfacing program.

The Importance of Combining Inspection and Maintenance Data

Jeremy Koonce, Collins Engineers, Inc, Chicago, IL

This presentation will highlight technology that is available today to assist in the merging of all data related to an asset.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 36

Room: A216

Project Level Transportation Planning

Organizer: Russell Critelli

Moderator: Russell Critelli

Hall of Fame Land Use and Connectivity Study - Developing a Decision Matrix Tool to Guide Integrated Land-Use and Transportation Scenario Planning

Bryan Newell, Gannett Fleming Engineers and Architects, P.C., Columbus, OH

Ryan Smalley, Envision Group LLC, Cleveland, OH

The Stark County Area Transportation Study (SCATS) Hall of Fame (HOF) Land Use and Connectivity Study addresses connectivity of the Johnson Controls Hall of Fame Village, an $800 million mixed-use development of the Pro Football Hall of Fame's campus underway in Canton, Ohio. As the first-ever sports and entertainment "Smart City", the HOF Village presents opportunities to capitalize on technological advancements and extend them to the study's "area of influence" so they can be leveraged to enhance connectivity and stimulate economic development to benefit the surrounding community.

Amish Vehicle Commute Characteristics, Amish Demographics, Horse-Drawn Vehicle Safety, and Partial Depth Pavement Preservation Best Practices

Munir Nazzal, Ohio University, Athens, OH

ODOT District 3 staff in conjunction with the ODOT Office of Statewide Planning and Research identified an existing need to update the Amish Buggy Safety on Ohio's State Roadway System Analysis and Action Plan. ODOT has initiated a series of new studies to identify Amish Migration Demographics through 2030, pavement preservation best practices, and roadway safety operation design, and recommendations for change.

New Real Estate Solutions for Project Delivery

Drew Gilmore, Ohio DOT, Columbus, OH

Real Estate has two new solutions for project managers to improve on-time delivery of projects involving right of way acquisition or utility coordination. ODOT was the first DOT in the country to develop policy and procedure to implement Federally funded early acquisition of RW. This process allows RW acquisition to occur prior to NEPA clearance, potentially clearing RW moths earlier than the traditional process. In the presentation we share the benefits of this new process, and scenarios in which it would be advantageous, within the context of the MUS CR 32 (Philo Bridge) project.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 37

Room: A110-112

Emerging Trends in Safety

Organizer: Michelle May

Moderator: Derek Troyer

National Safety Trends

Jane Terry, National Safety Council, Itasca, IL

The National Safety Council eliminates preventable deaths at work, in homes and communities, and on the road through leadership, research, education and advocacy. This presenter will discuss the increasing crash trends involving distracted driving, drugged driving, and fatigued driving.

How does Ohio compare?

Michelle May, Ohio DOT, Columbus, OH

As fatalities and total crashes continue to increase in the state, there are three areas of major focus: Older driver related crashes, distracted driving and drugged driving. The presenter will discuss what is being done at the state and local levels to move Ohio towards zero deaths on the roadways.

Session: 38

Room: A213-215

Prestressed Concrete

Organizer: Jonathan Huffman

Moderator: Jonathan Huffman

Prestressed Concrete Beams: Repair Strategies in the Unlikely Event that a Beam is Damaged.

Mike Perdew, Prestress Services Industries, LLC, Columbus, OH

Daniel Miller, Ohio DOT, Columbus, OH

This session will explain strategies for repairing beams when they are damaged by impact or during shipping or erection. The presentation will show some real examples of projects where repairs were performed. Dan Miller, from ODOT's OMM and other industry experts will be on hand to discuss approved repair products and why certain strategies work.

Diagnosing Deficiencies in Ten Ohio Post-Tensioned Bridges

Dallas Montgomery, Burgess & Niple, Inc., Louisville, KY

Michael Seal, Burgess & Niple, Inc., Columbus, OH

Many post-tensioned bridges built prior to 2003 are showing deficiencies in the steel tendons partly due to the lack of adequate grouting materials and construction procedures at the time they were constructed. This presentation will provide inspection and testing methods used to determine deficient conditions, rehabilitation plans developed for ten post-tensioned, and discussion of results from the projects.

Florida's Flexible Filler Experience

Natassia Brenkus, The Ohio State University, Columbus, OH

Grouted and bonded post-tensioning tendons are the predominant multi-strand post-tensioning systems used in bridges in the United States. Recent durability issues of grouted tendons have prompted the FDOT to move toward unbonded tendons using flexible fillers. Flexible fillers are intended to improve tendon durability and facilitating future maintenance and rehabilitation. The presentation will summarize the Florida experience with flexible fillers thus far including: mock-up tendon injections, structural testing of full size bridge girders, laboratory testing on multi-strand unbonded tendons subjected to a cyclic loading.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 39

Room: B131-132

Unmanned Aircraft Systems is a Three-Letter Word

Organizer: Dave Gallagher

Moderator: Dave Gallagher

Robotic Remote Sensing

Benjamin Lindner, GBA, Lenexa, KS

This session will explore current innovations in open source robotics, machine learning and artificial intelligence to automate processes that allow accuracies that represent real-world environments. This new breed of robots utilizes 3-D laser scanning, thermography, acoustic imaging, and high-resolution photographs to give engineers tools that enhance the speed and accuracy of assessing projects, while reducing cost and increasing safety. This session will explore forging partnerships between operators and end users to refine deliverables that increase usability, acceptance and insistence by design professionals in applications.

UAS are not UFOs

Steven Jones, DLZ, South Bend, IN

Matthew Roberts, DLZ, Akron, OH

We will cover the implementation of Unmanned Aerial Systems (UAS) in the planning, design, construction and maintenance of infrastructure projects, and how they fit into the future of infrastructure data management. We will progress through each stage of the process, listed below, showing how UAS can be utilized. - Planning: Traffic counts, mapping - Design: Survey, 3d visualization, Reality modeling - Construction: Pre-con documentation, Inspection, Progress tracking, Volume verification, As built documentation- Maintenance: Inspections, especially on bridges, Thermal imaging, Historic preservation.

Visualizing Your Project - UAS Integration into Civil Engineering

John Zuleger, Michael Baker International LLC, Cincinnati, OH

UAS is a burgeoning sophisticated tool in the engineering industry with significant potential towards advancing the industry. Understanding UAS capabilities is key for engineers interested in utilizing this technology to enhance projects. These adaptable platforms are advancing engineering techniques beyond simple photography providing engineers with highly efficient data gathering tools. This presentation will highlight a wide range of applicability to various projects from bridge inspections to construction management.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 40

Room: A113-115

A Look into Vehicle Automation

Organizer: Jiaqi Ma

Moderator: Jiaqi Ma

Transportation Research Center and the future of advanced mobility testing

Josh Every, Transportation Research Center (TRC), East Liberty, OH

Transportation Research Center Inc. (TRC Inc.) is the leading independent automotive testing facility and proving grounds in the U.S., specializing in research and vehicle testing. On 4,500 acres of land, TRC Inc. operates 24/7, ensuring the highest level of safety and security for its multiple customers. TRC Inc.'s experts collaborate with industry partners, to develop future mobility solutions for passenger and commercial vehicles, including autonomous and active safety technologies. TRC offers numerous facilities including a 7.5 miles high speed test track, a 50 acre vehicle dynamics area, 9,000 foot skid pad, durability and performance driving areas. TRC also boasts emissions, static and crash laboratories on site. Topics of discussion will include: - TRC's 540 acre Smart Mobility Advanced Research and Test (SMART) Center - SMARTCenter features - SMARTCenter designed based upon industry and government input - Smart mobility advancements - Expanded testing of connected and autonomous vehicles at TRC

Managed Lanes for Connected Automated Vehicles: Infrastructure Adaptation and Operational Management

Jiaqi Ma, University of Cincinnati, Cincinnati, OH

Managed lanes provide a more controlled traffic environment than general purpose lanes. Managed lanes developers and operators also often have the required institutional frameworks to implement innovative technologies such as CAV (Connected and Automated Vehicles) and stand to gain the benefits of enhanced operational performance through early adoption of CAV concepts. They also have the potential to impact market penetration by rewarding early adopters of equipped vehicles with higher-performing lanes, and so encouraging investment in CAV vehicles by drivers. Microsimulations are performed on multiple synthetic and real-world simulation networks. A research field experiment is in live traffic on I-495 Express Lanes in Virginia using automated vehicle fleets at the Turner Fairbank Highway Research Center of the Federal Highway Administration.

Latest on Legislation, Regulation, Guidance and More for Connected Automated Vehicles

Koorosh Olyai, Stantec Consulting Services Inc., Dallas, TX

The current legislative and regulatory guidance for AV deployment will change with the release of AV Start Act 3.0. How will AV communication technologies, spectrum sharing and data ownership be affected?

The Ethics of Autonomous Vehicles, Will You Let Your Car be the Death of You?

Allen Rutz, Vorys, Sater, Seymour and Pease LLP, Columbus, OH

Discussion of the ethics of autonomous or automatic decision making and the impacts to the professional engineer.

Tuesday, October 2, 2018 3:30 - 5:00 p.m. CPDs = 1.5

Session: 41

Room: A220-222

Advanced ITS Strategies

Organizer: Katie Zehnder

Moderator: John Gray

Michigan's Active Traffic Management - US23 Flex Route & US127/I496 Interchange

Rick Chelotti, Bergmann, Lansing, MI

Stephanie Palmer, Michigan DOT, Jackson, MI

The US-23 Flex Route utilizes overhead lane control gantries equipped with various intelligent transportation system (ITS) equipment to facilitate the following ATM strategies: dynamic shoulder use, dynamic lane control, variable speed advisories and queue warning. The US-23 Flex Route has been a great example of utilizing the allowable width plus current technologies to increase mobility through the corridor. This presentation will cover the development of this Active Traffic Management project from planning through construction and current operation. Also, because the route has been in operation, experiences with regard to how the system is operating versus what was anticipated during the planning phase will be reviewed. This project won the Eminent Conceptor Award for Engineering Project of the year as part of Michigan's 2018 ACEC Engineering & Surveying Excellence Gala. The Scoping/Planning phase of the US-127/I-496 ATM project in Lansing, Michigan will also be covered. US-127 is a heavily traveled directional corridor leading to/from downtown Lansing with heavy influence from Michigan State University. A detailed traffic analysis was completed along with investigation of the existing roadway and bridge conditions, review of safety within the study corridor, noise analysis, etc. in order to determine a consistent strategy to improve safety and the efficient movement of people and goods under existing and future conditions. The Bergmann Team investigated ATM strategies (including Part Time Shoulder Use with static, dynamic and full ATM systems and Ramp Metering) and permanent ("full-time") solutions (including roadway widening, auxiliary lane additions, elimination of ramps, reconfiguration of the existing US-127/I-496/Trowbridge Road interchange, etc.) as part of this study, eventually developing more than 10 alternatives for each direction of traffic to arrive at the preferred alternatives

TMC Operations as a Service

Mike Haas, IBI Group, Portland, OR

There are a lot of "as a Service" options being discussed in technology offerings today. Some have gained traction as meaningful innovations and others are still ideas waiting to be proven. Mobility, Software, Content, Platform (Maas, Saas, Caas, and Paas respectively) are just a few of the labels used for non-traditional offerings of service-oriented models of delivering value to consumers. Within the Traffic System Management and Operations area, service-oriented procurements present a new model to satisfy well defined operational needs. This presentation examines TMC systems such as ATMS, ATIS, Asset Management, Truck Parking Management, and Lane Closure Management; and TMC operations functions including control room operators, system maintenance, and service patrols and considers the technical and contractual issues associated with purchasing outcomes versus purchasing systems and staff. Examples and points of contact from industry will be provided along with lessons from early adopters of this approach. The purpose of this presentation is to generate dialog about the viability of outcomes "as a Service" as an approach to delivering solutions to transportation agencies.

Performance Measures & Big Data

Catherine Manzo, StreetLight Data, Inc., Richmond, VA

Tuesday, October 2, 2018 **3:30 - 5:00 p.m.** **CPDs = 1.5**

"Data is the most significant barrier to using performance measures," according to Transportation for America's latest Transportation Performance Measures 2017 survey. The question is, how can planners overcome this barrier and access this much-needed information, which is expensive to collect traditionally but also critical to designing sustainable solutions for today's communities? In this session, Ryan Link of StreetLight Data will discuss how affordable, on-demand big data can help planners define and assess performance measures using archival data. Ryan will begin the session by explaining how two key performance metrics, vehicle miles traveled and average annualized daily traffic, can be derived from big data created by mobile devices. He will walk attendees through this process with two specific case studies from Ohio. Next, Ryan will demonstrate how big data can help planners track progress towards specific planning goals at the project level. To do this, he will share three use cases focused on different goals: accessibility, air quality, and congestion management. For each case study, Ryan will address the specific metrics derived from big data that can be used to track progress towards these goals over time. To wrap up, Ryan will open the floor for questions from attendees. Attendees will walk away from this session with the basic knowledge necessary for them to determine how they may use big data to measure transportation infrastructure performance over time and for their own performance measurement goals.