

RO6D Peer Exchange

Peer Exchange Purpose:

- Share information focused on Asphalt Pavements and use of NDE technologies
- Post 2018 SHRP2 R06D GPR and Impact Echo/SASW experiences and advancements,
- To identify asphalt pavement delamination and moisture segregation, but
- Also provide an opportunity to share other benefits/uses of, or in combination with other technologies.

Peer Exchange Objectives:

- Recap of the SHRP2 R06D Research & Peer Exchange held in August 2018
- Share State Agency experiences and challenges in using NDE technology for evaluating asphalt pavement, with emphasis on identifying delamination and moisture segregation,
 - as well as sharing other benefits/uses of, or
 - in combination with other technologies
- Identify vendor technology advancements in equipment and software for evaluating asphalt pavements since August 2018

Peer Exchange Objectives (cont'd.):

- Identify gaps hindering advancement and implementation,
 - including system improvements, and
 - research needed to fill those gaps
- Discuss strategies to continue advancement efforts

Session Agenda

- **September 28, 2021** (All times Eastern)
- 11:00 am **Welcome and Opening Comments** Dennis Morian (QES)
- 11:05 am **Welcome from FHWA** Cooper, Jurado, & Yu (FHWA)
- 11:10 am **Introductions (Name, Org., Position)** Dennis Morian (QES)
- 11:25 am **Recap of SHRP2 R06D Research & Peer Exchange (Held August 2018)** Michael Heitzman (3D Radar)
- 11:50 am **Use of NDE Technologies for Asphalt Pavement (Uses, Experiences, and Challenges) – State Updates** (30 minutes each)
 - Minnesota – Eyoab Zegeye (MNDOT)
 - Texas/New Mexico – Darlene Goehl (TTI)
 - Virginia – Brian Diefenderfer (Virginia Transportation Research Council - VDOT)
- 1:20 pm – 1:50 pm **Lunch Break**

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Michael Heitzman (3D Radar)(Held August 2018)
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Michael A. Heitzman, PhD, PE

- Mike Heitzman, LLC, St. Louis, MO
- Introduction
- In October 2019, Dr. Heitzman finished 12 years as an Assistant Director with the National Center for Asphalt Technology. His previous career includes:
 - 9 years as the State Bituminous Materials Engineer for the Iowa Department of Transportation and
 - 18 years with the Federal Highway Administration
- Registered Professional Engineer in Washington State
- Numerous research, implementation, and training activities in the areas of friction, thermal properties, non-destructive testing, preservation, rehabilitation, ME pavement design, and ground tire rubber

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Dr. Eyoab Zegeye-Teshale

- Senior Pavement Research Engineer@ MnDOT - advanced understanding of pavement design, construction, forensic evaluation, and rehabilitation procedures
- Experience with FHWA, American Engineering and Testing Inc. (AET), University of Minnesota (UMN), and University Polytechnic of Turin
- Research interest-Modeling & characterization of bituminous mixtures; Fracture mechanics applied to quasi-brittle materials; cold recycling of asphalt pavements (i.e., CIR, CCPR, FDR, SFDR); Testing and evaluation of pavement using non-destructive testing technologies; and application of Ground Penetrating Radar (GPR) for pavement structures

Darlene Goehl

- Research Engineer at Texas A&M Transportation Institute (TTI) and registered PE in the state of Texas
- Joined TTI in November of 2016
- 28 years of service with TxDOT
- B.S. degree in Civil Engineer from Texas A&M University in 1988
- Currently working on pavement forensics, pavement design, accelerated construction and seal coat studies for TxDOT

Brian Diefenderfer, Ph.D., P.E.

- Principal Research Scientist at the Virginia Transportation Research Council, 17 years
- Research focuses on efforts to improve the performance of VDOTs pavement network and includes work related to traffic-speed structural testing, pavement recycling, and nondestructive testing
- Bachelor, masters, and doctoral degrees in Civil Engineering from Virginia Tech, and
- Licensed PE in Virginia

Afternoon Agenda

- 1:50 pm **Use of NDE Technologies for Asphalt Pavement (Uses, Experiences, and Challenges) – State Updates (Cont'd.)** (30 minutes each)
 - Florida – Guangming Wang (FDOT)
 - California – Bill Owen (Caltrans)
- 2:50 pm **Asphalt Pavement NDE Technology Advancements (Post SHRP2 R06D) – Vendor Updates** (30 minutes each)
 - 3D-Radar – Jacopo Sala
 - Olson Engineering – Larry Olson
- 3:50 pm **Day 1 Wrap-up** Dennis Morian (QES)
- 4:00 pm **Adjourn for Day 1**

Dr. Guangming Wang, PE

- State Pavement Performance Engineer -manages statewide programs including FWD, GPR, PMM, high friction surface treatment (HFST) and green colored pavement markings (GCPM)
- FDOT more than 5 years
- Consultant pavement/geotechnical engineer and project manager for more than 5 years
- Ph.D University of Florida degrees in Civil Engineering and Master of Science in Management
- Expertise includes pavement non-destructive testing and evaluation, pavement design and analysis, pavement management, pavement marking management (PMM) and pavement modeling

William Owen, PGP, CEG, PG

- Chief, Geophysics and Geology Branch, California Department of Transportation
- Manages and conducts engineering geophysical investigations for CalTrans, responsible for engineering geophysics investigations statewide
- 30 years of experience with geophysical investigations for environmental and engineering projects
- Over 20 years in ground penetrating radar applications
- Numerous papers on the application of geophysics to transportation and environmental problems, instructed on geophysical topics for the California Environmental Protection Agency, the University of California Extension and the Environmental and Engineering Geophysical Society

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Jacopo Sala

- Chief Scientist at 3D-Radar
- MSc in Engineering of Telecommunications
- Specializes in numerical signal processing, remote sensing, and geophysical methods
- Authored and co authored various scientific papers, articles and books on near surface geophysics, with particular focus on step frequency technology and array-based systems
- Coordinates the company's research efforts with the goal of converting raw radar data into the most valuable information for different applications

Larry D. Olson, P.E.

- President and Chief Engineer, Olson Engineering, Inc., and Olson Instruments, Inc.
- Expertise in nondestructive evaluation (NDE) of civil infrastructure including dams, bridges, buildings, foundations, pavements, tunnels, etc
- 40 years of consulting experience in structural condition assessment and monitoring, materials, pavement, geotechnical, geophysical, and vibration engineering
- BS Civil and MS (Geotechnical) Engineering degrees from the University of Texas at Austin which honored him as a distinguished alumnus in 2006
- Founded Olson Instruments, Inc. to manufacture NDE and seismic geophysical instruments in 1995

RO6D Day 2 : September 29, 2021 (All times Eastern)

- 11:00 am **Day 1 Recap** Dennis Morian (QES)
- 11:05 am **Asphalt Pavement NDE Technology Advancements (Post SHRP2 R06D) – Vendor Updates (Cont'd.)** (30 minutes each)
 - GSSI – Rob Sommerfeldt
 - Infrasense – Ken Maser
 - Road Scanners – Timo Saarenketo
- 12:35 pm **Use of NDE Technologies for Asphalt Pavement (Uses, Experiences, and Challenges) – State Updates (Cont'd.)** (30 minutes)
 - Kentucky – Brad Rister (UKY)
- 1:05 pm **Open Discussion (Other State Experiences and Q&A)**
 - All Attendees
- 1:30 pm – 2:00 pm **Lunch Break**

Rob Sommerfeldt

- Manager of Business Development, GSSI
- Introduced to the GPR industry in 2007
- Trained a wide range of applications using GPR including transportation
- Account manager specializing in the transportation industry since 2014

Ken Maser, Ph.D, P.E., Senior Principal

- Registered PE with over 40 years of experience in the application of non-destructive testing (NDT) technologies for evaluating pavements, bridge decks, tunnels, and other transportation infrastructure
- Consultant to the original SHRP program
- As Co-PI on the SHRP2 R06D research program
- Consultant to FDOT and MnDOT during the SHRP R06D implementation phase
- Winner of the 2019 ASCE Wilbur S. Smith Award for his leadership and innovation for development and implementation of subsurface condition evaluation of pavements and bridge decks

Dr. Timo Saarenketo

- CEO Roadscanners Group
- Also, adjunct Professor of traffic infrastructure diagnostics at the Tampere University in Finland
- Non-Destructive Testing based road, bridge and other traffic infrastructure asset diagnostics and proactive maintenance management
- Intensively working on how modern technologies can be implemented in intelligent asset management processes and
- How to improve the productivity of asset management that leads to cost further savings in annual paving costs
- Effect of autonomous vehicles and super heavy trucks on pavement structure performance

Agenda Status

- 12:35 pm **Use of NDE Technologies for Asphalt Pavement (Uses, Experiences, and Challenges) – State Updates (Cont'd.)** (30 minutes)
 - Kentucky – Brad Rister (UKY)
- 1:05 pm **Open Discussion (Other State Experiences and Q&A)**
 - All Attendees
- 1:30 pm – 2:00 pm **Lunch Break**

Brad Rister, PE

- Program Manager for the Pavement, Materials, Geotechnology, and Infrastructure Evaluation section of the Kentucky Transportation Center (KTC)
- Primary research interest is in applying remote sensing technologies as a non-destructive tool to help solve infrastructure issues in the design, construction, and maintenance phases for transportation projects
- Published several journal articles on the applications of ground penetrating radar (GPR), LiDAR, infrared thermography, and laser inspection to help engineers forensically analyze transportation infrastructure issues
- Bachelors and Master's Degree in Civil Engineering from the University of Kentucky

Agenda Status

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Afternoon Agenda

- 2:00 pm **Future Needs and Identification of Gaps** Brian Prowell (AMS/QES)
(Current and future needs, where do we go from here, what needs to happen next, what research is needed, etc.)
- 3:00 pm **Strategies to Continue Advancement Efforts** Dennis Morian (QES)
- 3:30 pm **Action Items for Moving Forward** Dennis Morian (QES)
- 4:00 pm **Adjourn for Day 2**

Agenda Status

- 3:00 pm **Strategies to Continue Advancement Efforts** Dennis Morian (QES)
- 3:30 pm **Action Items for Moving Forward** Dennis Morian (QES)
- 4:00 pm **Adjourn for Day 2**

Agenda Status

- 3:30 pm **Action Items for Moving Forward** Dennis Morian (QES)
- 4:00 pm **Adjourn for Day 2 & Peer Exchange**