

Fourth International Symposium on *Naturalistic Driving Research*

August 25-28, 2014

NSTSCE
National Surface Transportation
Safety Center for Excellence

 **VirginiaTech**[®]
Transportation Institute



welcome

The National Surface Transportation Safety Center for Excellence (NSTSCE) and the Virginia Tech Transportation Institute (VTTI) would like to welcome you to the Fourth International Symposium on Naturalistic Driving Research.

We have developed what we believe to be a dynamic, interactive and very informative symposium over the next few days. We trust that you will gain a greater understanding of our naturalistic driving research, as well as the research that is being done internationally in this area, and leave with a commitment to similar goals as expressed by our stakeholders.

*Thank you,
NSTSCE Stakeholders and VTTI*

Symposium Host

The National Surface Transportation Safety Center for Excellence (NSTSCE) at the Virginia Tech Transportation Institute (VTTI).

Mission

NSTSCE was established by the Federal Public Transportation Act of 2005 to develop and disseminate advanced transportation safety techniques and innovations in both rural and urban communities.

The mission of NSTSCE is defined as using state-of-the-art facilities, including the Virginia Smart Road, to develop and test transportation devices and techniques that enhance driver performance, evaluate the roadway environment and infrastructure-based safety systems, examine driver impairment issues, and address safe mobility for vulnerable road users.

Goals of the Center

Goal 1: Identifying age-related deficiencies in driving performance and developing methods and countermeasures to mitigate the associated risks

Goal 2: Understanding the role fatigue plays in crashes of both heavy and light vehicles and developing and evaluating countermeasures to reduce fatigue-related traffic incidents

Goal 3: Improving the nighttime roadway visual environment through the assessment of behavior, establishment of visibility needs, and control of adverse lighting effects

Goal 4: Developing a greater understanding of driver decision making and performance during normal driving through imminent crash situations in urban, rural, and freeway driving environments

Goal 5: Developing and evaluating new devices and techniques for enhancing driver performance

NSTSCE Stakeholders

Federal Highway Administration

Federal Motor Carrier Safety Administration

General Motors

Travelers

Virginia Department of Transportation /
Virginia Center for Transportation Innovation and Research

Virginia Tech Transportation Institute

Thank you to our sponsors!



*Kenneth M. Leonard,
Director of the Intelligent
Transportation Systems
Joint Program Office*



Kenneth M. Leonard was named the Director of the U.S. Department of Transportation (USDOT) Intelligent Transportation Systems Joint Program Office (ITS JPO) in December 2012. He is a member of Federal government's Senior Executive Service.

Mr. Leonard has over 30 years of Federal government and private sector leadership experience providing solutions in transportation, energy, investment decision making, defense, environment, regulatory affairs, and information systems. He joined the ITS JPO from the Federal Motor Carrier Safety Administration (FMCSA), where he served as a Senior Policy Advisor and Director of the Office of Analysis, Research and Technology. While there, he provided executive leadership and direction in improving FMCSA's project effectiveness and efficiency.

Previously, Mr. Leonard served as Federal Aviation Administration (FAA) Director of Aviation Weather, led the FAA's Technology Development Office and was manager of Investment Analysis. While at the FAA, he provided strategic direction, advancing cornerstone aviation weather enterprise systems and emerging technologies in support of the USDOT's Next Generation Air Transportation Systems initiatives.

While serving in the private sector, Mr. Leonard provided management oversight of complex and innovative research and development programs involving multibillion-dollar projects. Additionally, he developed strategies to improve standard business practices and reduce program cost risks. Mr. Leonard is a graduate of the George Washington University School of Public and International Affairs, where he earned a bachelor's degree in international economics and completed graduate-level studies in economics and finance.

*Ann Brach,
Director of the Second
Strategic Highway Research
Program (SHRP 2)*



Ann M. Brach is the Director of the Second Strategic Highway Research Program (SHRP 2) at the Transportation Research Board (TRB). She is responsible for overall direction of interdisciplinary research in the following areas: the role of driver behavior in highway safety; renewal of aging infrastructure; congestion mitigation; and collaborative decision-making in highway planning.

Prior to becoming the director, Dr. Brach served as the deputy director of SHRP 2 in which she oversaw the development of the largest-ever naturalistic driving study. In addition, she has conducted studies of funding trends, congressional earmarking, and stakeholder involvement in Federal transportation research programs.

Before coming to TRB, Dr. Brach was Research and Technology Program Manager at the Federal Highway Administration, and Chief of the Research and Technology Division of the Maryland State Highway Administration. She received a bachelor's degree in civil engineering from Northeastern University and a master of science and Ph.D. from the Massachusetts Institute of Technology, where she focused on management of research and innovation in the construction industry. She is a registered Professional Engineer in the Commonwealth of Virginia.





**AGENDA FOR THE
FOURTH INTERNATIONAL SYMPOSIUM
ON NATURALISTIC DRIVING RESEARCH**

NOTE: All sessions in Assembly Hall, Holtzman Alumni Center, lower level, The Inn at Virginia Tech, unless otherwise noted on agenda.

Monday, August 25, 2014 - SHRP 2 Data InSight Workshop

- 7:45 a.m. Workshop participants needing transportation to the Virginia Tech Transportation Institute (VTTI) – meet in lobby of The Inn at Virginia Tech for shuttle
- 8:00 a.m. – **Registration for Workshop/Symposium and Continental Breakfast**
- 9:00 a.m. *VTTI Main Lobby**
- 9:00 a.m. – **Workshop I: SHRP 2 Data InSight**
- 5:00 p.m. **Lead Organizer: Mike Mollenhauer, VTTI**
VTTI Organizing Committee: Jon Antin, Behnido Calida, Jon Hankey, Joel Kady, Suzie Lee, Lei Li, and Miguel Perez
*Location: VTTI Interchange Room**
*Lunch at VTTI; provided with workshop registration**
- 4:00 p.m. – **Registration**
- 5:30 p.m. *The Inn at Virginia Tech – Latham Foyer (Under the Grand Staircase)*
- 5:00 p.m. – **Workshop concludes – Break at VTTI**
- 5:30 p.m.
- 5:30 p.m. Monday workshop participants only – meet at front entrance of VTTI to leave for dinner off-site
- 6:00 p.m. – **Dinner – Hahn Horticulture Garden***
- 7:30 p.m. *Monday workshop participants only*

Tuesday, August 26, 2014 - Symposium Day 1

- 7:30 a.m. – **Registration**
- 9:30 a.m. *The Inn at Virginia Tech – Latham Foyer (Under the Grand Staircase)*
Continental Breakfast
Assembly Hall of The Holtzman Alumni Center at the Inn at Virginia Tech
- 8:00 a.m. – **Welcoming Remarks – John P. Capp, NSTSCE Chairman; Director, Global Safety Strategy &**
- 8:15 a.m. **Vehicle Programs, General Motors Global Product Development**

**Activity not held at The Inn*

8:15 a.m. –
10:00 a.m.

The Promise of Naturalistic Driving Realized: Evidence from the Naturalistic Teenage Driving Study

Moderator: Bruce G. Simons-Morton, Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

An Overview of Methods and Key Findings from the NTDS
Presenter: Bruce G. Simons-Morton, NICHD

Variability in Crash/Near-Crash Risk Among Novice Drivers
Presenter: Feng Guo, VTTI

The Effects of Cortisol Levels on Novice Driver Crash/Near-Crash Risk
Presenter: Marie Claude Ouimet, University of Sherbrooke

The Prevalence and Risk of Secondary Task Engagement with Novice Drivers
Presenter: Charlie Klauer, VTTI

Predictors of Crash Risk for Novice Drivers
Presenter: Johnathon Ehsani, NICHD

The Synergy Between Naturalistic Driving and Statistical Methodological Development: What Statistics Can Teach Us About Driving and Vice Versa
Presenter: Paul Albert, NICHD

10:00 a.m. –
10:15 a.m.



Continuous Break sponsored by Bendix

10:15 a.m. –
11:45 a.m.

Don't Look Now: NDS Distraction Methods and Findings

Moderator: Chris Hayes, Travelers
Discussant: Daniel Glaser, General Motors

Re-use of FOT Data to Assess the Frequency and Impact of Distracted Driving
Presenter: Andreas Landau, Wuerzburg Institute for Traffic Sciences (WIVW GmbH, Germany)
Co-authors: Barbara Metz, Volker Hargutt

Drivers' Visual Behavior When Using Hand-Held and Hands-Free Cell Phones
Presenter: Gregory M. Fitch, VTTI
Co-authors: Richard J. Hanowski, Miguel A. Perez

Examination of Drivers' Cell Phone Use Behavior at Intersections by Using Naturalistic Driving Data
Presenter: Shan Bao, University of Michigan Transportation Research Institute (UMTRI)
Co-authors: Huimin Xiong, Kazuma Kato, James Sayer

A Complex Driving Scenario for Describing Safety-Critical Event Causation
Presenter: Naomi Dunn, VTTI
Co-authors: Jeffrey S. Hickman, Richard J. Hanowski

11:45 a.m. –
12:00 p.m.



Continuous Break sponsored by Bendix

12:00 p.m. –
1:00 p.m.

Lunch with Keynote Address

Speaker: Ken Leonard, Director, Intelligent Transportation Systems Joint Program Office
Latham AB

1:00 p.m. –
1:30 p.m.



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Latham Foyer

Coffee, Tea & Pastries – Networking Session sponsored by Bosch

**Activity not held at The Inn*

1:30 p.m. –
3:00 p.m.

International NDS Progress and Lessons Learned

Moderator: John P. Capp, General Motors
Discussant: Feng Guo, VTTI

Advances in UDrive, the First Pure European Naturalistic Driving Study, Compared to Previous European FOT

Presenter: Guillaume Saint Pierre, Institut français des sciences et technologies des transports, de l'aménagement et des réseaux (IFSTTAR), France

Canadian Naturalistic Driving Study

Presenter: John Pearson, Council of Deputy Ministers Responsible for Transportation and Highway Safety, Canada

Shanghai Naturalistic Driving Study

Presenter: Shou-en Fang, Tongji University, China

Data and IRB Issues in International Naturalistic Driving Study

Presenter: Suzie Lee, VTTI

3:00 p.m. –
3:30 p.m.



Continuous Break sponsored by Bendix

3:30 p.m. –
5:00 p.m.

Using NDS to Improve the Health and Safety of Professional Drivers

Moderator: Steven K. Smith, Federal Motor Carrier Safety Administration

Discussant: Matthew S. Thiese, Rocky Mountain Center for Occupational and Environmental Health, University of Utah School of Medicine

Evaluating the Sleeper-Berth Provision: Preliminary Investigation into Usage Characteristics and Safety-Critical Event Involvement

Presenter: Susan A. Soccolich, VTTI

Co-authors: Myra Blanco, Richard J. Hanowski

Can Cab Engineering Create Passive Improvements in Driver Sleep, Health, and Fuel Efficiency?

Presenter: Josef Loczi, Ergonomics and Driver Health & Wellness

Co-author: Ryan Olson

Examining the Relationship between Drug Use and Involvement in a Safety-Critical Event

Presenter: Matthew C. Camden, VTTI

Co-authors: Susan A. Soccolich, Jeffrey S. Hickman, Richard J. Hanowski

Evaluation of Feedback to Truck Drivers to Increase Safe Driving Behaviors: Preliminary Findings

Presenter: Jennifer Bell, Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health

5:00 p.m. –
5:30 p.m.

Break

5:30 p.m. –
7:30 p.m.

Reception and Poster/Demonstration Session

Latham Ballroom



Delivering insights.
Driving results.™

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The Panjammers band sponsored by Meritor WABCO

**Activity not held at The Inn*

Poster Presentations

Senior Fitness-to-Drive Evaluation Using Naturalistic Driving Data

Presenter: Jon F. Antin, VTTI

Co-authors: Feng Guo, Youija Fang

Personality and Crash Risk

Presenter: Fearghal O'Brien, NICHD

Co-authors: Johnathon P. Ehsani, Bruce G. Simons-Morton, Kaigang Li, Jessamyn G. Perlus

Extending Naturalistic Driving Research to the Patrol Car: A Pilot Project

Presenter: Teena Garrison, Center for Advanced Vehicular Systems, Mississippi State University

Co-author: Daniel Carruth

Analysis of Driver Behavioral Adaptation to the Lateral Drift Warning System

Presenter: Adam Lawrence Greenstein, Maryland State Highway Administration

Using Naturalistic Data for Forward Collision Warning Design: Population Distributions of Time to Collision from the 100-Car Study

Presenter: Kristofer D. Kusano, Virginia Tech

Co-authors: Jade Montgomery, Hampton C. Gabler

Naturalistic Driving as a Tool to Better Understand the Self-Management of Driving of Older Drivers With and Without Visual Impairment

Presenter: Ioni Lewis, Centre for Accident Research and Road Safety – Queensland (CARRS-Q)

Co-authors: Joanne Wood, Philippe Lacherez, Mark King, Amy Schramm, Barry Watson

Successful Elements in a Health and Wellness Program for Commercial Motor Vehicle Drivers

Presenter: Erin Mabry, VTTI

Co-authors: Jeffrey S. Hickman, Richard J. Hanowski

Naturalistic Cycling Studies: What Are They, and How Do They Relate to Naturalistic Driving Research?

Presenter: Tibor Petzoldt, TU Chemnitz

Co-authors: Marco Dozza, Katja Schleinitz, Julia Werneke

Analysis of Mean Trip Speed of Motorcycle Riders

Presenter: Cameron S. Rainey, VTTI

Co-authors: Shane B. McLaughlin, Sherry L. Williams

Wednesday, August 27, 2014 - Symposium Day 2

7:30 a.m. – **Continental Breakfast**

8:00 a.m. *Assembly Hall of The Holtzman Alumni Center at the Inn at Virginia Tech*

8:00 a.m. – **Welcoming Remarks – Thomas A. Dingus, Director, VTTI**

8:15 a.m.

**Activity not held at The Inn*

8:15 a.m. –
9:45 a.m.

Ongoing Novice Driving Studies

Moderator: Thomas A. Dingus, VTTI

Discussant: Ruth Shults, Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention

Why Conducting In-Depth Naturalistic Riding Study?... Examples from Rider Trainees and Novices in France

Presenter: Stéphane Espié, IFSTTAR

Co-authors: Samuel Aupetit, Flavien Delgehier, S. Bouaziz

Using Naturalistic Driving Data to Examine Age and Gender Differences on Seat Belt Use

Presenter: Shan Bao, UMTRI

Co-authors: Huimin Xiong, James Sayer, Mary Lynn Buonarosa

Naturalistic Assessment of the First 10 Hours of Driving: The Supervised Practice Driving Study

Presenter: Johnathon Ehsani, NICHD

Teenage Driver Cellular Phone Use During the First Months of Driving

Presenter: Janet Creaser, University of Minnesota

9:45 a.m. –
10:00 a.m.



Continuous Break sponsored by Smartmicro

10:00 a.m.
– 11:15 a.m.

Student Paper Session

Moderator: James Hedlund

Assessment of Psychophysiological Characteristics of Drivers Using Heart Rate from SHRP 2 Face Video Data

Presenter: Abhijit Sarkar, VTTI

Co-authors: Zachary R. Doerzaph, A. Lynn Abbott

Crowd-sourced Connected-vehicle Warning Algorithm using Naturalistic Driving Data

Presenter: Alexandria M. Noble, VTTI

Co-authors: Shane B. McLaughlin, Zachary R. Doerzaph, Thomas A. Dingus

Naturalistic Drive Cycles Analysis and Synthesis for Pick-up Trucks

Presenter: Zifan Liu, Clemson University

11:15 a.m. –
11:30 a.m.



Continuous Break sponsored by Smartmicro

11:30 a.m. –
12:30 p.m.



Lunch with Keynote Address sponsored by SHRP 2

Speaker: Ann Brach, Director, SHRP 2

Latham AB

12:30 p.m. –
1:00 p.m.



Coffee, Tea & Pastries – Networking Session sponsored by Bosch

Latham Foyer

**Activity not held at The Inn*

1:00 p.m. –
2:30 p.m.

The Road Perspective: Infrastructure Applications

Moderator: Catherine McGhee, Virginia Department of Transportation (VDOT) and The Virginia Center for Transportation Innovation and Research (VCTIR)

Discussant: Carol Tan, Turner-Fairbank Highway Research Center

A Systemic Framework for Studying Traffic Crash Sequence Using Naturalistic Driving Study Data

Presenter: Craig P. Thor, Federal Highway Administration (FHWA)

Co-authors: Ken Wu, Paul P. Jovanis

Using NDS Video Data to Evaluate the Impact of Offset Left-Turn Lanes on Gap Acceptance Behavior

Presenter: Karin Bauer, MRIGlobal

Co-author: Jessica M. Hutton

Time Series Analysis of Driver Behavior on Curves

Presenter: Bo Wang, Center for Transportation Research and Education (CTRE), Iowa State

Co-authors: Shauna Hallmark, Nicole Oneyear

LiDAR: Another Potential Data Source

Presenter: Leslie Harwood, VTTI

Co-author: Zachary R. Doerzaph

2:30 p.m. –
2:45 p.m.



Continuous Break sponsored by Smartmicro

2:45 p.m. –
4:45 p.m.

The Future: Innovative Techniques in Data Extraction and Analysis

Moderator: Lincoln Cobb, FHWA

Discussant: Shane B. McLaughlin, VTTI

Automated Drive Analysis of Naturalistic Driving Studies with Looking-out Video

Presenter: Pujitha Gunaratne, Toyota Technical Center

Co-authors: Sujitha Martin, Eshed Ohn-Bar, Ravi Satzoda, Mohan Trivedi

Constructing a Distracted Driving Dataset

Presenter: Justin M. Owens, VTTI

Co-authors: Linda Angell, Jon Hankey, James Foley, Kazutoshi Ebe

Video-Based Measure Of Driver Heart Rate For Naturalistic Driving Data

Presenter: Jonny Kuo, Monash University Accident Research Centre (MUARC), Monash University, Australia

Co-authors: Sjaan Koppel, Judith L. Charlton

Video Based Validation of a Maneuver Classification Algorithm for Naturalistic Driving Data

Presenter: Andreas Landau, WIVW GmbH, Germany

Co-authors: Volker Hargutt, Barbara Metz

Weighted Feature Extraction for Driving Maneuver Recognition: A Study using Naturalistic UTDive Data

Presenter: Yang Zheng, University of Texas at Dallas

Co-authors: Amardeep Sathyanarayana, John H. L. Hansen

Data Mining for Driver Behavior in Normal Driving

Presenter: Laurette Guyonvarch, LAB Renault – PSA Peugeot Citroën, France

Co-authors: Michel Lutz, Cyril Chauvel, Francoise Josseaume, Anne Guillaume

4:45 p.m. –
5:00 p.m.

Concluding Remarks – Thomas A. Dingus, VTTI

**Activity not held at The Inn*

5:00 p.m. – **Symposium Concludes – Break for Thursday workshop participants**
5:30 p.m.

5:30 p.m. **Thursday workshop participants only – meet in the lobby of The Inn at Virginia Tech to leave for dinner off-site**

6:00 p.m. – **Dinner – Lane Stadium***
8:00 p.m. Thursday workshop participants only

Thursday August 28, 2014 - SHRP 2 Data InDepth Workshop

7:45 a.m. Workshop participants needing transportation to VTTI – meet in lobby of The Inn at Virginia Tech for shuttle

8:00 a.m. – **Continental Breakfast**

9:00 a.m. *VTTI Main Lobby**

9:00 a.m. – **Workshop II: SHRP 2 Data InDepth**

5:00 p.m. **Lead Organizer: Miguel A. Perez, VTTI**

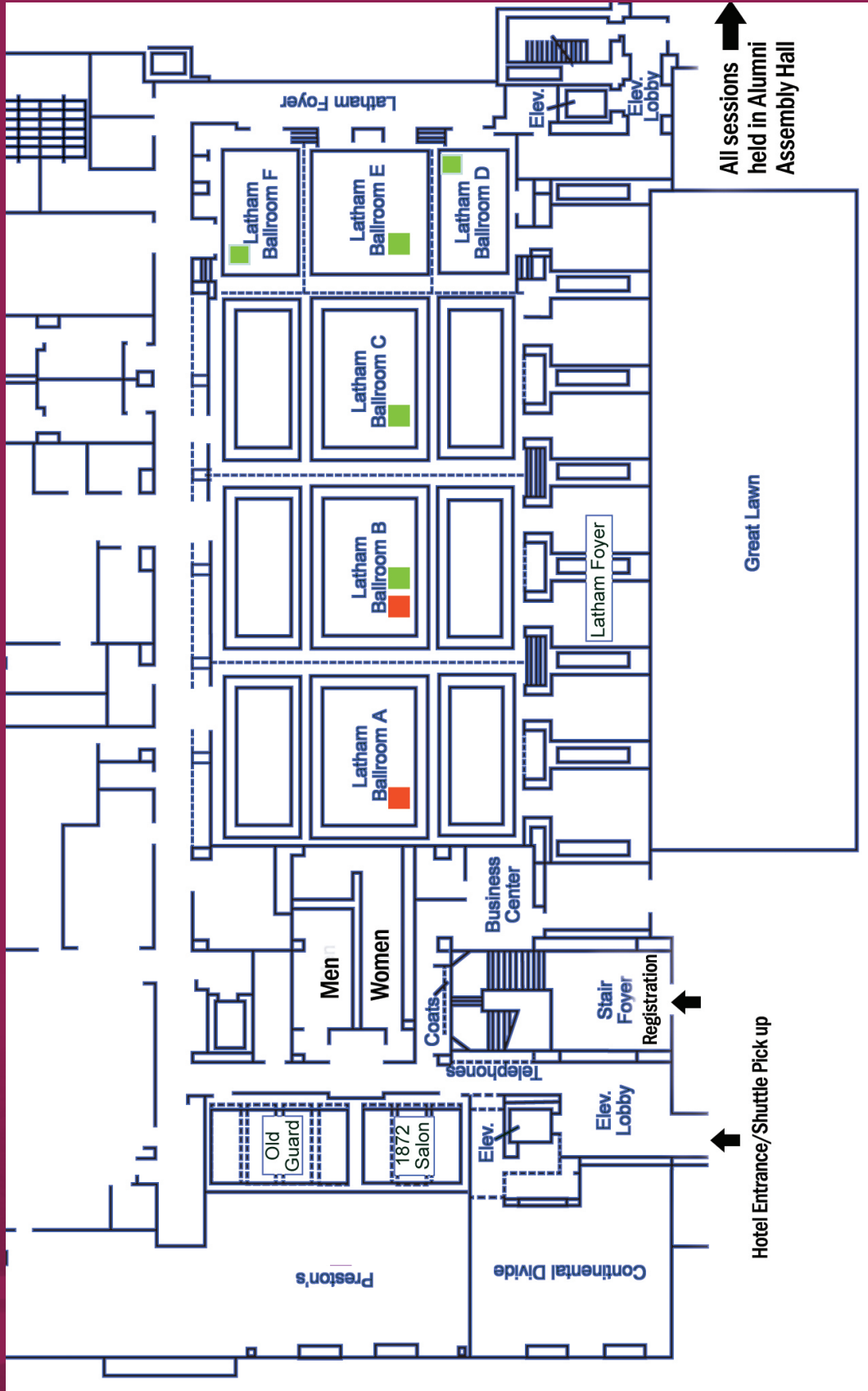
VTTI Organizing Committee: Behnido Calida, Joel Kady, Charlie Klauer, Suzie Lee, and Julie McClafferty

*Location: VTTI Interchange Room**

*Lunch at VTTI; provided with workshop registration**

**Activity not held at The Inn*

The Inn at Virginia Tech and Skelton Conference Center



Conference Lunches Reception/Poster Demonstration

Connecting to the wireless network at the Inn at Virginia Tech

1. Left click on the "Start Menu"
2. Left click "Control Panel"
3. Open "Network Connections"
4. Open "Wireless Network Connection"
5. Click "Enable"
6. Click "View Available Wireless Networks"
7. Select the "Hotel" Wireless Network
8. Click OK
9. Close all windows and open your web browser

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Please look for information as it becomes available and plan to join us for the Fifth International Symposium on Naturalistic Driving Research in 2016!

