TECHNICAL SESSIONS
Oral Presentations

Protection in Frontal, Side, and Rear Impact Crashes

Wednesday, May 13, 2026 | 08:30 – 12:30

Co-chair: Suzanne Tylko, Canada | Co-Chair: Jason Stammen, U.S.

TRACK A1 | Room: 206 C/D

The automotive industry has made significant improvements in crash protection over the last four decades. As innovative vehicle technologies emerge and change the composition of vehicles on the roads, examining the effects on occupant protection and ensuring that that injury risk measurement methods remain appropriate and effective. Papers are encouraged to discuss how to provide equitable occupant protection for these crash conditions. This session will include computational, experimental, and field studies that address occupant protection in frontal, side, and rear impacts with other road vehicles and roadside structures. Topics can include geometric and mass compatibility, occupant restraints, vehicle structure and interiors, and the measurement capabilities of Anthropomorphic Test Devices (ATDs).

PEER REVIEW PAPER No. ESV26-085

Frontal Crash Classification and Occupant Outcomes from 2017-2023 US Field Cases

Rodney Rudd[1]

[1]*National Highway Traffic Safety Administration, United States*

PAPER No - ESV26-150

Characteristics of Frontal Collision and Side-Collision Traffic Accidents in Japan

Yoshinori Tanaka[1], Yasuhiro Matsui[1], Naruyuki Hosokawa[1], Masatoshi Usui[1]
[1]*National Traffic Safety and Environment Laboratory, Japan*

PAPER No. ESV26-177

Field Data Review: Mechanisms and Risk Factors of Inboard-Side Torso Injuries in Far Side and Near Side Crashes

Alexandra Lazaros[1], Roland Furtado[1], Shiro Ohara[1], Ning Zhang[1]
[1]*Toyoda Gosei North America, Troy, Michigan, United States*

PAPER No. ESV26-254

Redefining Crash Compatibility for Autonomous Vehicle Integration

Victor Garcia[1], Karlheinz Kunter[2], Wolfgang Wagner[2], Jorge Velasco[3], Matteo Basso[4]
[1]*Applus+ IDIADA – IDIADA Automotive Technology S.A., Spain*
[2]*Virtual Vehicle Research GmbH, Austria*
[3]*Fundación CIDAUT, Spain*
[4]*Centro Ricerche Fiat SCPA, Italy*

PAPER No. ESV26-118

Heavy Truck Rear Impact Guard Dynamic Validation

Joshua Shaw[1], Berkan Guleyupoglu[1], Colleen Bendig[2], Angelo Marcallini[2]
[1]*National Highway Traffic Safety Administration, United States*
[2]*Transportation Research Center Inc., United States*

PAPER No. ESV26-207

Evaluating Occupant Protection and Vehicle Compatibility of Large Pickup Trucks

David Tidy[1], **Mark Terrell**[1], Blake Harris[2], Luke Gaylor[2]
[1]*ANCAP Safety, Australia*
[2]*Transport Accident Commission, Australia*

PAPER No. ESV26-141

Study of Load Cell Data of Frontal NCAP Tests to Address Crash Compatibility

Chung-Kyu Park[1], Rudolf Reichert[1], And Cing-Dao (Steve) Kan[1]
[1]*George Mason University, United States*

PAPER No. ESV26-229

Exploring the Limits of Occupant Safety in Frontal Car-HGV Impacts

Shweta Joshi[1], Robert Thomson[1], Jim Brouzoulis[1], Rikard Fredriksson[2], Krystoffer Mroz[3], Fredrik Törnvall[4], Reimert Sjöblom[5]
[1]*Chalmers University of Technology, Sweden*
[2]*Swedish Transport Administration; Chalmers University Of Technology, Sweden*
[3]*Autoliv Research, Sweden*
[4]*Volvo Group AB, Sweden*
[5]*Scania AB, Sweden*

REFRESHMENT BREAK

PAPER No. ESV26-083

Evaluation of DAMAGE Brain Injury Metric in Near-side Impacts. WorldSID and HBM comparison

Simona Roka[1], Pablo Lozano[1], Xufeng Li[2], James Ellway[3]
[1]*Applus IDIADA, Spain*
[2]*IDIADA China, China*
[3]*Euro NCAP, Belgium*

PAPER No. ESV26-251

A Comparison of the Influence of Arm Position on Measured Rib Deflections in an Oblique Pole Test between the WorldSID-50M ATD and the GHBMC Human Body Model

Jeff Dix[1], **Amanda Bukhtia**[1], K. Sajun Prasad[2], K. Sankar Narayanan[2], P. N. Vallabhaneni[2], Kulothungan Vimalathithan[2], R. Pramod[2]
[1]*Nissan Technical Center North America, United States*
[2]*Renault Nissan Technologies Business Center India Pvt Ltd, India*

PAPER No. ESV26-182

Side Impact Damage Patterns for Electric and Internal-Combustion-Engine Vehicles: A Comparison of Real-World Crashes with Updated IIHS Side Impact Tests

Becky C. Mueller[1], Haden Bragg[1], Raul Arbelaez[1], Jessica S. Jermakian[1], George Bahouth[2], Amin Vahabaghaie[2], Becca Drayer[2]

[1]*Insurance Institute for Highway Safety, United States*

[2]*Impact Research Inc., United States*

PAPER No. ESV26-257

Validation of an Advanced Side Impact System Finite Element Model with the SID-IIS

Miguel Corrales[1], Sophia Ngan[1], Duane Cronin[1], Hisaki Sugaya[2], Murthy Ayyagari[3], John Bolte[4]

[1]*Department of Mechanical and Mechatronics Engineering, University Of Waterloo, Waterloo, ON, Canada*

[2]*Honda Motor Company, LTD., Tokyo, Japan*

[3]*Honda Development & Manufacturing Of America, Ohio, United States*

[4]*Injury Biomechanics Research Center, The Ohio State University, Ohio, United States*

PAPER No. ESV26-178

Customizing Occupant Protection – Introducing the Real-Time Adapting Multi-Stage Load Limiting Seatbelt

Lotta Jakobsson[1], Fredrik Heurlin[2]

[1]*Volvo Cars, Chalmers University of Technology, Sweden*

[2]*Volvo Cars, Sweden*

PAPER No. ESV26-215

Evaluation of Variable Seatbelt Load Profiles on Occupant Kinematics and Thoracic Injury Using THOR And GHBMC Models In Frontal Collision

Kazuki Hikida[1], Shinya Hibara[1], Shibata Shinsuke[1], Osamu Kanno[1]

[1]*Honda R&D Co., Ltd., Japan*

PAPER No. ESV26-269

Adaptive Seat Kinematics with Integrated Force Limitation for Reclined Occupant Positions in Frontal Crashes

Nicolas Jakobs[1], Tim Hoffmann[1], Joerg Hoffmann[1]

[1]*Hochschule Für Technik Und Wirtschaft Des Saarlandes, Germany*

Driver Monitoring Systems to Prevent Crashes and Fatalities

Wednesday, May 13, 2026 | 08:30 – 12:30

Co-chair: Rikard Fredriksson, Sweden | Co-Chair: Stacy Balk, U.S.

TRACK B1 | Room: 206 A/B

Evolving vehicle technologies now provide opportunities to better understand both driver and occupant states. Applications of radar and camera-based vision systems may be used to detect unattended occupants and alert passersby to potential heatstroke. Additional camera-based vision systems may directly assess eye gaze direction or head/body position and classify a driver as distracted, asleep and/or drowsy, or otherwise incapacitated. Other systems may be able to interpret driver inputs such as lane position variability and acceleration patterns to infer drowsiness or other forms of impairment. Worldwide, more vehicles are being introduced to the market with differing driver and occupant monitoring systems. Papers related to differing technologies and methods to detect (or infer) driver and/or occupant states, their accuracy, reliability, and associated human-machine interfaces are invited.

PAPER No. ESV26-262

Development and Assessment of a Glance Location Prediction Model Consuming Camera-Based DMS Data

MIGUEL A. PEREZ[1 2], JULIE MCCLAFFERTY[2], ZACHARY BOWDEN[2], **THOMAS FINCANNON**[3], STARLA WEAVER[3]

[1]*Biomedical Engineering Department, Virginia Tech, Virginia Tech*

[2]*Virginia Tech Transportation Institute, Virginia Tech*

[3]*National Highway Traffic Safety Administration, United States*

PAPER No. ESV26-204

Anticipatory Driver Risk Prediction System through Behavioral Monitoring Integrated with Daily Health Data

Shigenobu Mitsuzawa[1], Satoru Shinkawa[1], Hiroshi Ono[1], Hiroki Taniguchi[1], Yecan Wang[1]
[1]*Honda R&D Co., Ltd., Japan*

PAPER No. ESV26-071

Driver Monitoring-Based Suppression of Lane Keep Assist Activations: A Field Operational Test

Luke Neurauter[1], Marty Miller[1], Laura Hamm[1], Jacobo Antona-Makoshi[1], Dan Glaser[2]
[1]*Virginia Tech Transportation Institute, United States*
[2]*General Motors, United States*

PAPER No. ESV26-027

Safety Use Case Analysis and Likely Benefits Of DMS: Examination of Driver States and Scenarios under the EuroNCAP 2026 Driver Engagement Protocol

Michael Fitzharris[1], Sara Liu[1], Mike Lenné[2], Bruce Corben[3], Claes Tingvall[1 4 5], Andrew Morris[6]
[1]*Accident Research Centre, Faculty Of Medicine, Nursing, And Health Sciences, Monash University, Australia*
[2]*Seeing Machines, Australia*
[3]*Corben Consulting, Australia*
[4]*Monash University Accident Research Centre, Australia*
[5]*Chalmers University Of Technology; ÅFry, Sweden*
[6]*Loughborough University, United Kingdom*

PAPER No. ESV26-202

The Influence of Uncertainty-Related Visual Behavior on Safe Driving: a Driving Simulator Study

Erika Tsumaya[1], Miki Cho[1], Shin'ichi Murakami[1]
[1]*Honda R&D Co. Ltd., Saitama, Japan*

PAPER No. ESV26-024

Gaze-Informed Scene Understanding for ADAS: Integrating Detection Transformers and Large Language Models in Real-World Driving

Ghazal Farhani[1], Taufiq Rahman[1], Vidyasagar Rajendran[2], Dominique Charlebois[3]
[1]*Connected And Autonomous Vehicles Team, National Research Council Canada (NRC), London, Ontario, Canada*
[2]*Formerly NRC*
[3]*Transport Canada, Ottawa, Ontario, Canada*

PAPER No. ESV26-114

Wrong Way and Impaired Driving Detection - Using the Vehicle as a Sensor

Patrick Moraca[1]
[1]*SAI-NAV, LLC (Inventor & Owner); P.E. Environmental Engineering, Arizona; P.E. Civil Engineering (Various States); NCEES; B.S. Electrical Engineering; IIT Carnations, USDOT Tier 1 Center (Tech Transfer Board Member 2026), United States*

PAPER No. ESV26-131

Status of NHTSA's Research on Unattended Child Reminder Systems

Aloke Prasad[1], Avary Snyder[2]
[1]*National Highway Traffic Safety Administration, United States*
[2]*Transportation Research Center Inc., United States*

REFRESHMENT BREAK

PAPER No. ESV26-272

Multi-Modal Emotion Detection in Naturalistic Driving Environments

Boyu Jiang[1], Liang Shi[2], **Feng Guo**[1 2], Aya Sasaki[3], Tomoaki Ohashi[3]
[1]*Department Of Statistics, Virginia Tech, Blacksburg, Virginia, United States*
[2]*Virginia Tech Transportation Institute, Blacksburg, Virginia, United States*
[3]*Honda R&D Co., Ltd., Saitama, Japan*

PAPER No. ESV26-238

Development and Verification of a Testing Methodology for Driver Alcohol Intoxication Detection Systems

James D. Jackson[1], **Francesco Deiana**[1], Cristina Periago[1], Simone Toma[1]
[1]*Applus IDIADA, Spain*

PAPER No. ESV26-133

In-Vehicle, Breath-Based Alcohol Detection Device Test Procedure Development

Sughosh J. Rao[1], Yuhao Chen[1], William Harvey[1], John I. Martin[1], Charles Wang[1]
RC Inc.; National Highway Traffic Safety Administration (NHTSA), United States

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PAPER No. ESV26-075

Evaluating Driver Perceptions of Integrated Safety Monitoring Systems for Alcohol Impairment and Distraction

Roshik Nagasai Patibandla[1], Ross Greer[2]
[1]*MOT Charter School, Wilmington, DE, United States*
[2]*University of California, Merced, CA, United States*

Artificial Intelligence and Machine Learning for Enhanced Vehicle Safety

Wednesday, May 13, 2026 | 08:30 – 12:30

Co-chair: Chris Evans, U.S. | Co-Chair: Marcus Wisch, Germany

TRACK C1 | Room: 200 A/B/C

Artificial intelligence (AI) and machine learning (ML) approaches hold potential to synthesize large amounts of data to address hard problems and are rapidly being explored across a variety of industries and use cases. This session invites discussions around what AI means in the automotive context, how it is used both in vehicle systems and subsystems, and how it can be leveraged to develop actionable safety insights. Areas of interest include ways that AI/ML methods can use data from sources such as real-world crash databases, telemetry, and simulation to inform countermeasures and safety assessment methodologies. Papers are also invited that discuss AI/ML in vehicle system applications such as in-service system health monitoring and diagnostics, ADAS/ADS perception and planning, and driver monitoring. This includes the verification and validation of continuously evolving AI/ML systems, and questions around training set coverage, robustness, and explainability.

PAPER No. ESV26-225

CI Net: A Conditionally Robust Multi-Modal Biometric System for In-Cabin Driver Identification

Jihyeon Kim[1]

[1]*Safety System/Logic Engineering Team, Hyundai Mobis, South Korea*

PAPER No. ESV26-140

Toward Responsible AI for Adaptive Restraint Systems: A Hybrid Approach Integrating Simulation and Real-World Crash Data

Noboru Tanase[1], Shizue Katsumata[1], Mie Tokuyama[1], Takahiro Ando[1]
[1]*Toyota Motor Corporation, Japan*

PAPER No. ESV26-206

A Robust Design Approach for Far-side Head Protection Airbags Using a Surrogate Model

Nozomi Suzuki[1], Yusuke Chida[1], Hiroyuki Hirayama[1], Keiichiro Sashi[1]
[1]*Honda Motor Co., Ltd., Japan*

PAPER No. ESV26-289

A Check Engine Light for the Automotive Industry: Detecting Automotive Failures from Consumer Complaints and Online Forums

Tommy Jones[1], Likhitha Kempegowda[2], Spencer Krivo[2], Adrian Ng[1]
[1]*Georgetown University, United States*
[2]*DrivePulse*

PAPER No. ESV26-241

Systematizing the Unusual: A Guideword- and Ontology-Based Method for Road Hazard Identification and Analysis in Driving Automation Safety Assurance (GOBI) and a Hazard Catalog

Krzysztof Czarnecki[1]

[1]*University of Waterloo, Canada*

PAPER No. ESV26-149

Synthesis of Training and Validation for Automated Driving System AI Perception Models

Feng Guo[1], Abhijit Sarkar[1], Liang Shi[1], Guangwei Yang[1], Eric Thorn[2], Travis Terry[3], Pawan Kallepalli[3], Matthew Van Gennip[3], Xiao Qin[4], Ashish Gupta[4]

[1]*Virginia Tech, Blacksburg, Virginia, United States*

[2]*Southwest Research Institute, San Antonio, Texas, United States*

[3]*Global Center For Automotive Performance Simulation, Alton, Virginia, United States*

[4]*Auburn University, Auburn, Alabama, United States*

PAPER No. ESV26-053

Adaptive Masking for Video Autoencoders (DriveMAE): A Frame-aware Framework for Self-Supervised Learning

Zirui Lin[1], **Ling Bai**[1], Islam Osman[1], Chongyu Yuan[2], Neda Parnian[2], Mohamed S. Shehata[1], Zheng Liu[1]

[1]*University of British Columbia, Canada*

[2]*MATT3R Technologies Inc., Canada*

PEER REVIEW PAPER No. ESV26-009

Visual Language Model Driven Annotation and Analysis of Maneuver Data for AI-Enhanced Autonomous Vehicle Safety

Ling Bai[1], Chongyu Yuan[2], Islam Osman[1], Zirui Lin[1], Ghazal Mirab[2], Amir Saheb[2], Neda Parnian[2], Evgeny Shapiro[2], Mohamed S. Shehata[1], Zheng Liu[1]

[1]*University of British Columbia, Canada*

[2]*MATT3R Technologies Inc., Canada*

REFRESHMENT BREAK

PAPER No. ESV26-031

Robust Detection, Association, and Localization of Vehicle Lights: A Context-Based Cascaded Neural Network Approach & Evaluations

Akshay Gopalkrishnan[1], **Maitrayee Keskar**[1], Mohan Trivedi[1], Ross Greer[1 2]

[1]*Laboratory For Intelligent And Safe Automobiles (LISA), University Of California, San Diego, United States*

[2]*Machine Intelligence, Interaction, And Imagination (Mi[3]) Laboratory, University Of California, Merced, United States*

PAPER No. ESV26-220

Looking and Listening Inside and Outside: Multimodal Artificial Intelligence Systems for Driver Safety Assessment and Intelligent Vehicle Decision-making

Ross Greer[1], Maitrayee Keskar[1], **Laura Fleig**[2], Erika Maquiling[1], giovanni Tapia Lopez[1], Angel Martinez-Sanchez[1], Parthib Roy[1], Jake Rattigan[3], Mira Sur[3], Alejandra Vidrio[3], Thomas Marcotte[3], Mohan Trivedi[2]

[1]*Machine Intelligence, Interaction, And Imagination (Mi[3]) Laboratory, University of California, Merced, United States*
[2]*Laboratory for Intelligent and Safe Automobiles (LISA), University Of California, San Diego, United States*
[3]*Center For Medicinal Cannabis Research (CMCR), University Of California, San Diego, USA*

PAPER No. ESV26-224

Vision and Language: Novel Representations and Artificial Intelligence for Driving Scene Safety Assessment and Autonomous Vehicle Planning

Ross Greer[1], Maitrayee Keskar[1], Angel Martinez-Sanchez[1], Parthib Roy[1], Shashank Shriram[1], Mohan Trivedi[2]
[1]*Machine Intelligence, Interaction, And Imagination (Mi[3]) Laboratory, University Of California, Merced, United States*
[2]*Laboratory For Intelligent And Safe Automobiles (LISA), University Of California, San Diego, United States*

Protection of Non-Occupant Road Users

Wednesday, May 13, 2026 | 14:00 – 18:00

Co-chair: Yasuhiro Matsui, Japan | Co-Chair: Garrick Forkenbrock, U.S.

TRACK A2 | Room: 206 C/D

Crash injuries to pedestrians, bicyclists, motorcyclists, and other road users are major contributors to morbidity. Each of these road-user groups presents unique challenges for the assessment of injury risk and the design of safety countermeasures. This session will include computational, experimental, and field studies related to the protection of pedestrians, cyclists, motorcyclists, and innovative mobility devices, including micro-mobility devices such as e-scooters and e-bikes.

PEER REVIEW PAPER No. ESV26-057

Characterization of Fatal Cyclist Collisions involving Nine-Type-Vehicles Traveling at Low and High Speeds in Japan

YASUHIRO MATSUI[1], SHOKO OIKAWA[1]

[1]*National Traffic Safety and Environment Laboratory, Japan*

PEER REVIEW PAPER No. ESV26-078

Effects of Vehicle Speed, Category, and Front-End Design on Full-Body Injury Risks of a Mid-Sized Male Pedestrian

LUIS POVEDA[1], LOGAN E. MILLER[1], COLIN EDWARDS[1], MADELINE POLLOCK[1], WILLIAM ARMSTRONG[1], FANG-CHI HSU[1], SCOTT F. GAYZIK[1], ASHLEY A. WEAVER[1], JOEL D. STITZEL[1], **KARAN DEVANE**[1]

[1]*Wake Forest University School of Medicine, United States*

PAPER No. ESV26-294

Refinements in Benchmarking for Vulnerable Road User Collisions by Comparing Naturalistic Driving and Police-report Data

Eamon Campolettano[1], John Scanlon[1], Kristofer Kusano[1]

[1]*Waymo LLC, United States*

PAPER No. ESV26-127

Head Injuries to Helmeted Motorcycle Riders in the U.S.

Ann Mallory[1], Kelly Satterfield[1], Vikram Pradhan[2]

[1]*Vehicle Research and Test Center, National Highway Traffic Safety Administration, United States*

[2]*Transportation Research Center Inc., United States*

PAPER No. ESV26-231

Do Helmets Mitigate Head Injuries of Powered Two-Wheeler Riders in Front-On Collisions with Trucks?

Mohan Jayathirtha[1], Santosh Chopade[2], Rahul Mahajan[2], Shiyang Meng[3]

[1]*Autoliv Research, India*

[2]*The Automotive Research Association Of India, India*

[3]*Autoliv Research, Sweden*

PAPER No. ESV26-086

The New Frontier of Powered-Two-Wheelers Safety: Autonomous Emergency Steering Field Tested on a Motorcycle

VALENTINO CROCIANI[1], COSIMO LUCCI[1], **VALENTINA GRACI**[2 3], GIOVANNI SAVINO[1]
[1]Department of Industrial Engineering, University of Florence, Italy
[2]Center for Injury Research and Prevention, Children's Hospital Of Philadelphia, USA
[3]School of Biomedical Engineering, Science And Health Systems, Drexel University, USA

REFRESHMENT BREAK

PAPER No. ESV26-120

Development of an Objective Function to Predict Head Impact Time in Headform Impact Tests of Deployable Pedestrian Protection System

BERKAN GULEYUPOGLU[1], PETER G. MARTIN[1]
[1]National Highway Traffic Safety Administration, United States

PAPER No. ESV26-117

Review of NHTSA Pedestrian Head Impact Test Data for Atypical Glass Fracture

PATRICK SMITH[1]
[1]National Highway Traffic Safety Administration, United States

PAPER No. ESV26-112

Windscreen Fracture Behaviour During Impactor and Full-Scale Vehicle to Dummy Tests and its Significance for the Safety of Pedestrians and Bicyclists in Real-World Crashes

Oliver Zander[1], Neri Fattorini[1], Marcus Wisch[1]

[1]*Federal Highway and Transport Research Institute (BASt), Germany*

PAPER No. ESV26-119

Heavy Vehicle and Vulnerable Road User Case Review

Joshua Shaw[1], Berkan Guleyupoglu[1], Sean Puckett[1], Chris Wiacek[1]

[1]*National Highway Traffic Safety Administration, United States*

PAPER No. ESV26-199

Research on the Effects of Internal Pressure Characteristics of Pedestrian Protection Airbag on Head Injury Meterics During Collisions

Hidetoshi Nakamura[1], Hiroyuki Asanuma[2]

[1]*Honda Motor Co., Ltd., Japan*

[2]*Honda R&D Co., Ltd., Japan*

PAPER No. ESV26-123

Assessment of the Advanced Pedestrian Legform Impactor (aPLI) in U.S. Fleet Vehicle Tests Protection of Non-Occupant Road Users

Tim Coffin[1], **Angela Tesny**[1], Brian Suntay[2]
[1]*National Highway Traffic Safety Administration, United States*
[2]*Transportation Research Center Inc., United States*

PAPER No. ESV26-129

Cooperative Safety: Emergency Pedestrian Stop – Integrating Pedestrian Behavior into Collaborative Avoidance Strategies

Thomas Lich[1], Jörg Mönnich[1], Lisa Sulzberger[1], Christian Löffler[2], David Chifiriuc[3]
[1]*Bosch Research, Accident Research, Robert Bosch GmbH, Germany*
[2]*Bosch, Engineering Technology, Robert Bosch GmbH, Germany*
[3]*Bosch Engineering Center, Cluj-Napoca, Robert Bosch Romania, Cluj County, Romania*

PAPER No. ESV26-295

Pedestrian Interactions with Level 4 Automated Driving Systems: Evaluation of a Novel Auditory External Human Machine Interface

Gabrial T. Anderson[1], Sadie Cooke[1], Luke Neurauter[1], **Sheila G. Klauer**[1], Srinath Sibi[2], **Jeremy Yang**[2], Lowell Pickett[2], Ellen Xing[2], Kyle Evans[2], Jasmine Kim[2], Huadong Wang[2], Rossitza Kotelova[2], Stephen A. Ridella[2], Rafael Patrick[3], Tanner Upthegrove[3]
[1]*Virginia Tech Transportation Institute, United States*
[2]*Zoox, United States*
[3]*Virginia Tech, United States*

Human Factors in Driving Automation and the Role of the Driver and Occupants

Wednesday, May 13, 2026 | 14:00 – 18:00

Co-chair: Andre Wiggerich, Germany | Co-Chair: Peter Burns, Canada

TRACK B2 | Room: 206 A/B

Driving automation continues to evolve, and lower levels of automation have become more prevalent on the roadway. It is evident that there must be careful emphasis on design considerations for both system capabilities and drivers' interactions with partial driving automation systems. This includes conveying information to the driver on when and where partial automation systems can be used and the limitations of those systems. Implementing driver engagement measures is important – which may require technology to assess the driver's state and carefully designing an effective human-machine interface to keep drivers engaged in the driving task when needed. In the case of SAE Level 3 automation, new human-machine interaction challenges arise including when to bring a driver back into the driving task and how this can be safely and effectively accomplished. In the case of ADS-operated vehicles, the focus shifts to providing appropriate information to the occupants. These needs will likely be different based on individual use-cases for the ADS (e.g., fixed route, ride-hail, personal ownership). Papers are invited on research related to the driver-vehicle interface (including transition of control strategies) for partial driving automation and ADS-equipped vehicles. In addition, for ADS technologies, particularly those without traditional controls, papers are invited on additional topics such as external communication, telltales, and other signaling that may be useful for occupants of ADS vehicles, and human factors design needs for people with disabilities.

PAPER No. ESV26-170

A Meta-Analysis of Human Factors in Partially Automated Driving Systems

Davide Maggi[1], Akos Kriston[1], Biagio Ciuffo[1]
[1]*European Commission – Joint Research Centre, Italy*

PEER REVIEW PAPER No. ESV26-026

The Impact of Transition Window Duration on Nominal Transitions of Control in Conditional Automation

John Gaspar[1], Chris Schwarz[1], Michelle Reyes[1], Thomas Fincannon[1], Christian Jerome[1]
[1]*Driving Safety Research Institute, University Of Iowa; National Highway Traffic Safety Administration, United States*

PAPER No. ESV26-217

Who is driving? An approach to assess AD(A)S' proneness to mode confusion

Maartje De Goede[1], Diane Cleij[1], Reinier J. Jansen[1], Rins B. E. De Zwart[1]
[1]*SWOV Institute for Road Safety Research, The Netherlands*

PAPER No. ESV26-050

Defining and Testing Scenarios to Assess Minimum Attentional Requirements While Driving: Conceptualization and Findings from a Simulator Study

Katharina Kummerer[1 2], Sebastian Hergeth[2], Christian Gold[2], Josef F. Krems[1]
[1]*Chemnitz University of Technology, Germany*
[2]*BMW Group, Germany*

PAPER No. ESV26-028

Behavioral Adaptation to Partial Automation With Torque-Based Driver Monitoring: Glances, Hands On Wheel, and Emergent Behaviors

Pnina Gershon[1], T. Zach Noonan[1], Josh Domeyer[2]

[1]*MIT Center For Transportation & Logistics, AgeLab, Cambridge, United States*

[2]*Toyota Collaborative Safety Research Center*

PEER REVIEW PAPER No. ESV26-025

Are Drivers More Distracted with L2 Automated Technologies? An NDS Analysis of Frequency, Duration, and Proportion of Time Drivers Engage in Secondary Tasks

Sheila "Charlie" Klauer[1], Naomi Dunn[1], Gabrial T. Anderson[1], Ellen Barnes[1], Shu Han[1], Thomas Fincannon[1], Starla Weaver[1]

[1]*Virginia Tech; National Highway Traffic Safety Administration, United States*

REFRESHMENT BREAK

PAPER No. ESV26-146

Driver Behaviours with Ford BlueCruise

Jacqueline Paris[1], **Yousif Al-Ani**[1]

[1]*Thatcham Research, United Kingdom*

PAPER No. ESV26-244

Communicating User-Relevant Information on Automated Driving and the Role of Media Formats: A User-Centered Perspective

Emma Czupi[1], Elisabeth Shi[1], Florian Sellmann[2], Demian Scherer[3]

[1]*Section F4 Automated Driving, Federal Highway Research Institute (BASt), Germany*

[2]*Würzburger Institut Für Verkehrswissenschaften (WIVW GmbH), Germany*

[3]*Catholic University of Applied Sciences, Cologne, Germany*

PAPER No. ESV26-205

Implications of Collaborative Steering on Automated Driving Safety

Robert Fuchs[1], Yuta Iwai[1], Syoma Edamoto[1], Daisuke Hashioka[1], Danish Wan[1]

[1]*JTEKT Corporation, R&D Headquarters, Japan*

PEER REVIEW PAPER No. ESV26-056

Understanding and Modeling Effectiveness of Predictive Risk Notifications for Early Assistance for Safe Driving: A Public-Road Testing Study

Masaki Maruyama[1], Keiichiro Koyama[1], Toru Ezaki[1], Junichi Sakamoto[1], Yuta Sawada[1], Takahiro Matsuoka[1]

[1]*Honda R&D Co., Ltd., Japan*

PAPER No. ESV26-268

Automated Driving System (ADS) Marker Lights On-Road Study and Questionnaire

Nikolas Sciortino[1], Daniel Betz[2], Stephanie Seupke[2]

[1]*Mercedes-Benz North America Research & Development, United States*

[2]*Mercedes-Benz AG, Germany*

PEER REVIEW PAPER No. ESV26-005

Driver Understanding of Yellow Indication Laws and Preferences for Configuration of In-vehicle Alerts for Dilemma Zones

Erika Anderson[1], Hisham Jashami[1], Ananna Ahmed[2], David Hurwitz[1]

[1]*Oregon State University, School of Civil and Construction Engineering*

[2]*Toyota Motor North America, Collaborative Safety Research Center, United States*

PEER REVIEW PAPER No. ESV26-081

Increasing the Competency and Confidence of Older Drivers in the Use of Advanced Vehicle Technologies: The Movetech Randomised Controlled Trial

Helen Nguyen[1], Kerrie Ren[2], Kristy Coxon[3], Nick Neville[4], Joan O'Donnell[5], Beth Cheal[3], Julie Brown[1], Lisa Keay[2]

[1] *The George Institute for Global Health, Injury Division, Australia*

[2] *University Of New South Wales, School of Optometry and Vision Science, Australia*

[3] *Western Sydney University, School of Health Sciences, Australia*

[4] *Driving Assessment & Rehabilitation Service, Australia*

[5] *The University of Sydney, School Of Health Science, Australia*

PAPER No. ESV26-200

Quantifying User Experience of Lane Support Systems

Sam Deylen[1], Mark Terrell[1], Adriano Palao[2], Richard Schram[2]

[1]*ANCAP Safety, Australia*

[2]*Euro NCAP, Belgium*

Safety of Alternate Fueled Vehicles

Wednesday, May 13, 2026 | 14:00 – 16:00

Co-chair: Peter Martin, U.S. | Co-Chair: Dean MacNeil, Canada

TRACK C2 | Room: 200 A/B/C

As vehicle powertrains transition from internal combustion to electric and hydrogen fuel cell systems, new risks are emerging. These risks include fires in battery packs, combustible gas leakage, and tank overpressures. This session invites papers on safety considerations for alternate fuel vehicles, including stranded energy, fire incident response, sensors for safe operation, evaluation of damaged vehicles, charging and fueling safety, water immersion, and emerging technologies. Papers are invited to discuss both design, evaluation and incident response related to these rapidly evolving vehicle technologies.

PAPER No. ESV26-052

Electric Vehicles – Risks, Unknowns, Safety & Emergency Preparedness Considerations

SNEHA LELE[1], ALEXANDER DAHLMANN[1]

[1]*Exponent, United States*

PAPER No. ESV26-094

Assessing the Safety Challenges and Vulnerabilities of Electric Vehicle Battery Packs Under Saltwater Immersion Conditions

KEVIN MEUDT[1], RANDY BEWLEY[1], MATTHEW SHIRK[1], JORDAN TODD[1], LEE WALKER[1], **TANVIR R. TANIM**[1], DHANANJAY ANAND[2]

[1]*Energy Storage Research and Analysis Department*

[2]*Advanced Transportation Department*

PAPER No. ESV26-100

Diagnostics Techniques for Early Detection of Failure in EV Batteries

LORAINE TORRES-CASTRO[1], ALEX BATES[1], EMILY KOWALCHUK[1], LUCAS GRAY[1]

SANJAY PATEL[2], PETER MARTIN[2]

[1]*Power Sources R&D, Sandia National Laboratories, United States*

[2]*National Highway Traffic Safety Administration, Department of Transportation, United States*

PAPER No. ESV26-132

Understanding Saltwater-Induced Failures in Lithium-Ion Batteries for Electric Vehicles

TONY THAMPAN[1], CHUANBO YANG[2], NATHANIEL SUNDERLIN[2], AHMAD PESARAN[2], SARAH CARDINALI[2]

[1]National Highway Traffic Safety Administration, United States

[2] National Lab of the Rockies, United States

PAPER No. ESV26-263

Crash Testing of Fuel-Cell Electric Vehicles with Hydrogen

MIGUEL A. GALLEGO RUIZ[1], VICTOR GARCIA SANTAMARIA[1], SAUL MARTIN MEDINA[1] AND GENÍS MENSA VENDRELL[1]

[1]IDIADA Automotive Technology S.A., L'Albornar, Tarragona, Spain

PAPER No. ESV26-276

Holistic Safety Assessment of Lithium-Ion Batteries for Electric Vehicles: Combined Scenario Analysis and Safety State Diagram Development

AKOS KRISTON[1], FABRIZIO MINARINI[1]

[1]European Commission Joint Research Centre, Ispra, Italy

PAPER No. ESV26-029

Driving Dynamics and Implications of Electrified Powertrains: Evaluating Differences in Driving Kinematics between Electric and ICE Vehicle

Pnina Gershon[1], T. Zach Noonan1, John Lenneman2

1MIT Center for Transportation & Logistics, AgeLab, Cambridge, MA, USA

2Toyota Collaborative Safety Research Center

REFRESHMENT BREAK

Advancing Vehicle Safety Through Virtual Testing: Challenges and Opportunities

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Wednesday, May 13, 2026 | 16:00 – 18:00

Co-chair: Taufiq Rahman, Canada | Co-Chair: Jay Chen, U.S.

TRACK C2 | Room: 200 A/B/C

There is increasing activity around virtual testing for different aspects of motor vehicle safety, from crashworthiness testing to the evaluation of complex automated driving systems. This session would provide researchers with an opportunity to discuss the challenges they face in developing and validating test platforms, generating meaningful and reliable test results beyond simple graphical representations, and how virtual testing fits into broader testing and evaluation goals. Papers should focus on the potential uses of virtual testing for safety validation and oversight, rather than on simulation and modeling for other aspects of vehicle development.

PAPER No. ESV26-172

Virtual Testing of Automated Driving Systems through Credible Simulations

RICCARDO DONÀ[1], ESPEDITO RUSCIANO[1], **AKOS KRISTON**[1], DAVIDE MAGGI[1], BIAGIO CIUFFO[1]

[1]*Joint Research Centre for The European Commission*

PAPER No. ESV26-213

A Novel Test Approach for Investigating Multi-Ego Vehicle Following Scenarios in the Case of Radar and V2X-Based Collision Avoidance Systems

Roland Nagy[1], Tamás Márton Kazár[1], Zsolt Szalay[1], Árpád Török[1], Zsombor Pethő[1]

[1]*Department Of Automotive Technologies, Faculty Of Transportation Engineering And Vehicle Engineering, Budapest University Of Technology And Economics, Műegyetem Rkp. 3., H-1111 Budapest, Hungary*

PAPER No. ESV26-299

Validation Methodology for an Augmented Reality Testing Implementation For An Automated Driving System

Harnarayan Singh[1], Linda Capito[1], Saeed Maleki[1],Kanna Sundararaman Venkateshwara[1]

Sughosh Rao[1], Devin Elsasser[2], Kamel Salaani[2]

[1]*Transportation Research Center Inc., United States*

[2]*National Highway Traffic Safety Administration, Vehicle Research and Test Center, United States*

PAPER No. ESV26-104

Building Trust in Virtual Testing of In-Vehicle Road Safety Measures: Identification of Expectable Inter-Tool Variations

Peter Wimmer[1], **Henri Chajmowicz**[2], Jeroen Uittenbogaard[3], Leonid Tulin[4], Lars Schories[5]
[1]*Virtual Vehicle Research GmbH, Austria*
[2]*LAB PSA/Renault, France*
[3]*TNO, The Netherlands*
[4]*TÜV Süd Czech, Czech Republic*
[5]*ZF Friedrichshafen AG, Germany*

PAPER No. ESV26-273

Evaluation of Select Test Methods for Non-Pneumatic Tires

Jonathan Darab[1], Yi Li[1], Prathamesh Khade[1], Luke Neurauter[2], Dave Kizyma[2]
[1]*Global Center For Automotive Performance Simulation, United States*
[2]*Virginia Tech Transportation Institute, United States*

Experimental and Computational Advances in Biomechanics and Human Injury Research

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Thursday, May 14, 2026 | 08:30 – 12:30

Co-chair: Andre Eggers, Germany| Co-Chair: Duane Cronin, Canada

TRACK A3 | Room: 206 A/B

The study of human injury mechanisms and risks is essential to continued improvement in occupant and vulnerable road user crash protection. An enhanced understanding of the factors associated with injury outcomes may be gained through experimental testing or using computational tools. This technical session will include studies that address: (1) experimental and field data studies related to human biomechanical response and injury mechanisms; (2) development or improvement of computational human body models, including considerations for human variability related to sex, anthropometry, stature, age, and injury tolerance; (3) application of human body models for the development of innovative technologies; (4) advances in development of injury risk curves, injury criteria, and performance specifications.

PAPER No. ESV26-162

Analysis of the Effects of Restraint Devices on Maxillofacial Fractures in Frontal Collisions

HITOSHI IDA[1], MASASHI AOKI[1], MICHIHISA ASAOKA[1], **AKIMITSU TANAKA**[1], MASAHITO HITOSUGI[2]

[1]*Toyoda Gosei Co., Ltd., Japan*

[2]*Shiga University of Medical Science, Japan*

PEER REVIEW PAPER No. ESV26-007

Comparative Analysis of Thoracic Injury and Causative Factors Across Sexes in Serious Frontal Motor Vehicle Collisions in the Crash Injury Research and Engineering Network Database

William Armstrong[1], **Karan Devane**[1], William Armstrong[1], Fang-Chi Hsu[1], Nina Heilmann[1], Joel Sink[1], Anna N. Miller[1], Bahram Kiani[1], R. Shayn Martin[1], Joel D. Stitzel[1], Ashley A. Weaver[1]

[1]Wake Forest University School of Medicine, United States

PAPER No. ESV26-126

Effect of Atrophy on Brain Displacement in Experimental Rotation Testing

Ann Mallory[1], Angela Tesny[1], Heather Rhule[1], Colton Thomas[1], Vikram Pradhan[2] Kevin Moorhouse[1], Kelly Satterfield[1], Yun-Seok Kang[3]

[1]Vehicle Research and Test Center, National Highway Traffic Safety Administration

[2]Transportation Research Center Inc.

[3]Injury Biomechanics Research Laboratory, Ohio State University

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PEER REVIEW PAPER No. ESV26-092

Injury and Kinematics of Obese PMHS in Frontal Impacts with Reclined Seating

Frank Pintar[1], Karthik Somasundaram[1], Narayan Yoganandan[1]

[1]Medical College of Wisconsin, United States

PAPER No. ESV26-108

Effect of Pre-Existing Neck Surgeries on Spinal Responses in Frontal Impact: Implications for Elderly Occupants

Balaji Harinathan[1], **Tyler F. Rooks[1],** And Narayan Yoganandan[1 2]
[1]Medical College Of Wisconsin, Department Of Neurosurgery, Milwaukee, WI
[2]Clement J. Zablocki Veterans Affairs Medical Center, Milwaukee, WI
United States

PAPER No. ESV26-255

Cortical Bone Fracture Injury Risk Curve Based on Tissue Properties and Stress Triaxiality Applied to Predict Femur Fracture in Human Body Models

Miguel Corrales[1], Duane Cronin[1]
[1]Department of Mechanical and Mechatronics Engineering, University Of Waterloo, Canada

PAPER No. ESV26-292

Preliminary Evaluation of Biofidelity of Human Body Models of Rear-Facing Seats in High-Speed Frontal Collision

Yongjin An[1], Yeonjong Park[1], Dayoung Kim[1], Taewung Kim[1], Sung Rae Kim[2], Dae Chang Jung[3], Ga Ram Jeong[3], Yun-Seok Kang[4]
[1]Tech University Of Korea, South Korea
[2]Hyundai Motor Company, South Korea
[3]Hyundai Mobis Co., Ltd., South Korea
[4]Ohio State University, United States

PAPER No. ESV26-148

Experimental and Numerical Investigation of Belt Loading for Small Stature Female Occupants in Rear Seat Frontal Crash

Brock Watson[1], Tanvi Seeburrun[1], Patrick Thangarajah[1], Kathy Tang[1 2], Suzanne Tylko[2], Duane Cronin[1]

[1]*University Of Waterloo, Canada*

[2]*Innovation Center, Transport Canada, Canada*

REFRESHMENT BREAK

PAPER No. ESV26-186

Investigation of Mechanism for Thoracic Skeletal Injury with Sub-Chamber Side Airbag for Elderly Female Occupants in Side Impact

Hisaki Sugaya[1], Fan Zhang[1], Masaki Ankai[1], Kenyu Okamura[1]

[1]*Honda Motor Co., Ltd., Japan*

PAPER No. ESV26-197

Effectiveness of Sub-Chamber Side Airbags in Reducing Thoracic Injuries for Obese Occupants in Side Impacts

Masaki Ankai[1], Hisaki Sugaya[1]

[1]*Honda Motor Co., Ltd., Japan*

PAPER No. ESV26-249

Effectiveness of Human Body Models of Representing Real World Injury Patterns and Mechanisms

Philipp Wernicke[1], Dustin Draper[1], Marius Rees[1], Steffen Peldschus[2]
[1]*BMW AG, Germany*
[2]*Ludwig-Maximilians-Universität, Germany*

PAPER No. ESV26-180

Evaluation of the abdominal response of THUMS AM50 V7 replicating the biofifelity and height sensitivity tests of THOR 50M

Jose L. Torres Ariza[1 2], Christopher R. Torres San Miguel[1], Javier F. Rivera Hoyos[2], Luis Martínez Sáez[2]
[1]*Instituto Politécnico Nacional, Ciudad De México, México*
[2]*Universidad Politécnica De Madrid - INSIA, Madrid, España*

PAPER No. ESV26-274

Instrumentation and Analysis of THUMS Simulations for Whole Body Injury Prediction

Neal Morgan[a], Chris Lovenduski[a], Tim Edinger[a], Jaehyuk Heo[a], Logan Zentz[a], And Bronislaw Gepner[a]
[a]*Center For Applied Biomechanics, University Of Virginia, Charlottesville, Virginia United States*

PEER REVIEW PAPER No. ESV26-038

Geometric Variabilities and Their Effects on Impact Responses in Midsize Male and Female Occupants

Jingwen Hu[1], Yang-Shen Lin[1], Kyle Boyle[1], Sujata Khandare[1], Anne Bonifas[1], Matthew P. Reed[1], Vikas Hasija[2]

[1]*University Of Michigan Transportation Research Institute*

[2]*National Highway Traffic Safety Administration*

United States

PAPER No. ESV26-175

Strategies for Injury Prediction With Human Body Models

Jason Forman[1], Bronislaw Gepner[1], Jaehyuk Heo[1], Karl-Johan Larsson[2], Martin Ostling[2], Bengt Pipkorn[3], And Jason Hallman[4]

[1]*University of Virginia Department Of Mechanical And Aerospace Engineering*

[2]*Autoliv*

[3]*Volvo Cars*

[4]*Toyota Motor North America R&D*

Safety Assessments for ADS-Operated Vehicles (SAE Levels 3, 4, and 5)

Thursday, May 14, 2026 | 08:30 – 12:30

Co-chair: Peter Striekwold, The Netherlands| Co-Chair: Terunao Kawai, Japan

TRACK B3 | Room: 206 C/D

As Automated Driving Systems (ADS) development activities continue toward the goal of removing reliance on human drivers, the assurance of their safety for public acceptance has never been more critical. This session aims to explore the multifaceted approaches to assessing the safety performance of ADS-equipped vehicles. This session invites papers that address innovative methodologies for evaluating safety, including metrics developed to quantify safety performance and the tools used to measure it. With diverse use cases ranging from low-speed shuttles and unoccupied delivery vehicles to hub-to-hub automated highway trucks, the unique challenges presented by ADS, including overall performance, occupant protection and crashworthiness, warrant rigorous scrutiny. There is particular interest in contributions that contextualize proposed assessment methods in relation to real-world outcomes, especially when alternative or mixed methods—such as virtual frameworks—are employed. Submissions may discuss fidelity measures for simulation approaches, independent validation techniques, operational safety monitoring approaches, methods associated with storing and analyzing large volumes of driving data, approaches to identifying minimum datasets to validate assumptions and system performance, approaches to independently evaluating sub-functions of driving automation, such as perception, prediction, planning, etc.; electronics systems safety (functional safety, safety of the intended functionality), cybersecurity and accompanying innovative strategies to establish a robust measure of trust in presented safety results. This session seeks to highlight not only the performance of ADS in navigating complex environments but also the implications for occupant safety and protection. We encourage researchers, practitioners, and industry experts to share their insights on the scientific methods driving safety assurance, thereby contributing to the ongoing dialogue about achieving maturity in ADS and fostering public confidence.

PAPER No. ESV26-102

A Method to Identify Potential Edge Cases for Automated Vehicles from Crash Perspective

Martin Urban[1] , Jorge Lorente Mallada[2]
[1]*Fraunhofer Institute For Transportation And Infrastructure Systems IVI, Germany*
[2]*Toyota Motor Europe NV/SA, Belgium*

PAPER No. ESV26-152

LiDAR Performance in Adverse Conditions

Amogh Sakpal[1], Ulrich Kradepohl[1], Adrian Zlocki[1]
[1]*Fka GmbH, Aachen, Germany*

PAPER No. ESV26-159

Research of Collision Detection Using Side Impact Prediction by ADAS Sensor and Its Effect on Occupant Injury

Kenyu Okamura[1], Hisaki Sugaya[1], Keita Akiho[1], Fan Zhang[1], Masaki Ankai[1]
[1]*Honda Motor Co., Ltd. Automobile R&D Center, Japan*

PAPER No. ESV26-160

Assessing the Safety Performance of Autonomous Low Speed Shuttles

Von Lindsey[1]
[1]*Lindsey Research Inc. LLC, United States*

PEER REVIEW PAPER No. ESV26-055

Machine Learning-Driven Safety Analysis of Automated Vehicles in Simulated Mixed Traffic Environments

Ángel Losada Arias[1], Paul Rosenkranz[1], Andreas Hula[1], Michael Aleksa[1], Peter Saleh[1], Isabela Erdelean[1]

[1]*AIT Austrian Institute of Technology GmbH, Austria*

PAPER No. ESV26-168

Testing method for Autonomous Driving in mixed traffic

Maximilian Grabowski[1], **Bryan Bourauel**[1]

[1]*Federal Highway And Transport Research Institute (BASt), Germany*

PAPER No. ESV26-173

Multilayers and Continuous Safety Assessment of ADS-Vehicles: The Ultra-Safe System Approach

Espedito Rusciano[1], Riccardo Donà[1], Biagio Ciuffo[1], **Akos Kriston**[1], And Maria Cristina Galassi[2]

[1]*Joint Research Centre for The European Commission*

[2]*Directorate General For Internal Market, Industry, Entrepreneurship And SMEs For The European Commission*

PAPER No. ESV26-179

Human and Artificial Intelligence Together: How Active Driving Assistance is Transforming Road Safety

Amy Oke[1], Dominique Charlebois[1], Guillaume Bergeron[2], Guillaume Pierre[2]

[1]*Transport Canada, Canada*

[2]*PMG Technologies Inc., Canada*

Student Design Competition Presentations

Thursday, May 14, 2026 | 11:00 – 12:30

Co-chairs: Student Design Competition Coordinators

TRACK C3 | Room: 200 A/B/C

Consumer-Focused Approaches to Promote Vehicle Safety in the Automotive Market

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Thursday, May 14, 2026 | 08:30 – 12:30

Co-chair: Andre Seeck, Germany| Co-Chair: Michiel van Ratingen, The Netherlands,

TRACK C3 | Room: 200 A/B/C

Consumer information programs have become widely accepted in the United States, Europe, Japan, Australia, Korea, China, Latin America, and Asia. These programs provide a range of vehicle safety ratings for passive and active vehicle technologies. The motor vehicle industry continues to improve the safety performance of vehicles as it strives to receive the highest safety marks possible. In addition to assessing occupant crash safety, programs are emphasizing advanced driver assistance systems, occupant monitoring systems, and considering approaches for automated vehicle technologies. While assessment strategies vary from region to region, the programs all aim to encourage continuous improvements in motor vehicle safety. Papers are invited to discuss test conditions, performance measures, presentation and dissemination of results, public acceptance, and consideration of emerging safety technologies. Automated Driving Systems (ADS) introduce an integration of active and passive safety ratings and may increase the importance of virtual testing.

PAPER No. ESV26-155

Raising Safety Awareness in a Sustainable Way

JOCHEN FEESE[1]

[1]*Mercedes-Benz AG, Germany*

PAPER No. ESV26-139

Designing ADAS for Indian Roads: Meeting Local Needs and Behaviours

KRISHNATH SANKPAL[1], NÚRIA PARERA[1], AKSHAY MAGAR[1], ALOK KULKARNI[1], HEMANT DESHMUKH[1], (**JORDI BARGALLO PRESENTING**)

[1]Applus+ IDIADA, Spain

PAPER No. ESV26-290

Integrating Robustness in Euro NCAP 2026 Crash Avoidance Assessment

ADRIANO PALAO[1], RICHARD SCHRAM[1], RIKARD FREDRIKSSON[2], MATS PETERSSON[3], STEPHAN RYRBERG[3], ANDREAS RIGLING[4], ASHLEY PATTON[5]

[1]Euro NCAP, Belgium

[2]Trafikverket, Sweden

[3]RISE, Sweden

[4]ADAC, Germany

[5]HORIBA MIRA, United Kingdom

PAPER No. ESV26-166

Developing a Consumer Safety Rating for Heavy Goods Vehicles

RICHARD SCHRAM[1], MATTHEW AVERY[1], IAIN KNIGHT[2], COLIN GROVER[2]

[1]Euro NCAP, Belgium

[2]Apollo Vehicle Safety Limited, UK

PAPER No. ESV26-210

ANCAP's Large Utilities (Pick-Ups) Test and Assessment Program

Samuel Deylen[1], Mark Terrell[2], Rhianne Robson[2]
[1]*ANCAP Safety, Australia*
[2]*ANCAP Safety, Australia*

PAPER No. ESV26-171

Rating Driver Monitoring System and SAE Lv.2: from Expectations to Reality

Davide Maggi[1], Konstantinos Mattas[1], Akos Kriston[1], Biagio Ciuffo[1]
[1]*European Commission Joint Research Centre, Ispra, Italy*

PAPER No. ESV26-211

Implementation of Equitable Occupant Protection in The Euro NCAP Consumer Rating Scheme

James Ellway[1], **Volker Sandner**[2], Simona Roka[3], Corina Klug[4], Katarina Bohman[5], Karsten Hallbauer[6], Oliver Zander[7]
[1]*European New Car Assessment Programme, Belgium*
[2]*ADAC, Germany*
[3]*Applus IDIADA, Spain*
[4]*Technical University of Graz, Austria*
[5]*Volvo Cars, Sweden*
[6]*Joyson Safety Systems, Germany*
[7]*BASt, Germany*

PAPER No. ESV26-283

Euro NCAP Virtual Testing in Frontal Impacts

Simona Roka[6], Corina Klug[1], Felix Ressi[1], Bernd Schneider[1], Xiaobing Bu[2], Tony Roberts[3], Thota Venkateswarlu[4], James Ellway[5], Michiel Van Ratingen[5]

[1]*Graz University Of Technology, Austria*
[2]*CATARC, China*
[3]*JLR, United Kingdom*
[4]*Nissan Technical Center Europe, United Kingdom*
[5]*Euro NCAP, Belgium*
[6]*Applus IDIADA, Spain*

PAPER No. ESV26-243

Post-Incident Survivability and Emergency Egress: Consumer-Focused Approaches to In-Vehicle Fire and Submersion Safety

Sabrina Percher[1], Shawn-Patrick Percher[1], Mario Verdi[1], Gordon Giesbrecht[2], Jean-Samuel Chenard[3], Steve Glassey[4], Aram Amassian[1, 5], Douglas Campbell[6]

[1]*AWOS Technologies, Canada*
[2]*University of Manitoba (Retired), Canada*
[3]*Motsai Research, Canada*
[4]*Public Safety Institute of New Zealand, New Zealand*
[5]*North Carolina State University, United States*
[6]*Automotive Safety Council, United States*

Advances in Crash Test Dummies, Instrumentation, and Data Analysis

Thursday, May 14, 2026 | 14:00 – 18:00

Co-chair: Astrid Linder, Sweden| Co-Chair: Kevin Moorhouse, U.S.

TRACK A4 | Room: 206 A/B

Dummy developments to enhance biofidelity and measurement capabilities are necessary to correctly represent human responses and effectively evaluate safety countermeasures in physical tests. This session will include papers that address all aspects of dummy development, including, but not limited to, studies of biofidelity, durability, repeatability, and reproducibility. Studies related to test methodologies (e.g., dummy positioning protocols), dummy evaluation, instrumentation, and injury metrics will also be included.

PEER REVIEW PAPER No. ESV26-072

The Effect of Initial Foot Position on THOR-50M Lower Leg Response in a Realistic Vehicle Buck

Junior Noss[a], John-Paul Donlon[a], Anna Morris[b], Germain Samier[c], Joseph Park[d], Hyungjoo Kim[e], And Jason Forman[a]

[a]*Center For Applied Biomechanics, University Of Virginia, Charlottesville, Virginia*

[b]*Washington And Lee University, Lexington, Virginia*

[c]*Institut Catholique D'Arts Et Métiers, Lille, France*

[d]*Department Of Orthopaedic Surgery, University Of Virginia, Charlottesville, Virginia*

[e]*Republic Of Korea*

PAPER No. ESV26-058

The Sensitivity of THOR-50M Neck Flexion Response to Pendulum Test Configuration

Garrett Mattos[1], Keith Friedman[1], Khanh Bui[1], John Hutchinson[1], Jacqueline Paver[2]
[1]*Friedman Research Corporation, United States*
[2]*Center for Injury Research, United States*

PAPER No. ESV26-192

Sensitivity of THOR-50M Injury Outcomes to Assessment Testing Variability in Frontal Crash

Daiki Furukawa[1], Andre Eggers[2]
[1]*Toyota Motor Corporation, Japan*
[2]*Federal Highway and Transport Research Institute (BASt), Germany*

PAPER No. ESV26-221

Comparison of 50th Percentile Male ATD Performance in Moderate-Speed Rear Impacts

Angela Tesny[1], Angelo Marcallini[2], Alexander Bendig[2]
[1]*National Highway Traffic Safety Administration, Vehicle Research and Test Center, United States*
[2]*Transportation Research Center Inc., United States*

PAPER No. ESV26-109

Thoracic Deflection Biofidelity of the Latest THOR-05F Anthropomorphic Test Device

Tyler F. Rooks[1], Jared Koser[1], Narayan Yoganandan[1 2] , Clement J. Zablocki2

[1]*Medical College of Wisconsin, Department Of Neurosurgery, Milwaukee, WI, United States*

[2]*Veterans Affairs Medical Center (VAMC), Milwaukee, WI, United States*

PAPER No. ESV26-253

Thoracic Response of the THOR-5F Small Female Dummy to Restraint Loading

Anthony Dellicolli[1], Jeff Dix[1], Natalie Hewett[2], Pete Luepke[2]

[1]*Nissan Technical Center North America, United States*

[2]*Nissan North America, United States*

REFRESHMENT BREAK

PEER REVIEW PAPER No. ESV26-032

Neck and Spinal Responses in the Reclined Large Omnidirectional Child (LODC) Anthropomorphic Test Device During Far-Side Lateral Oblique Impacts

Valentina Graci[1], John Humm[1], Hans Hauschild[1]

[1]*Children's Hospital of Philadelphia / Drexel University, United States*

PAPER No. ESV26-035

Multi-Point Chest Deflection in the Large Omnidirectional Child ATD: The Effect of Booster Seat and Seatback Angle During Far-Side Lateral Oblique Impacts

Hans Hauschild[1], John Humm[1], Valentina Graci[2 3]

[1]*Medical College of Wisconsin, United States*

[2]*Childrens Hospital of Philadelphia, United States*

[3]*School of Biomedical Engineering, Science And Health Systems, Drexel University, United States*

PAPER No. ESV26-143

Improved Specifications of the Q10 Dummy for Robust Performance

Michael Putzer[1], Björn Hohage[2], **Philipp Wernicke**[3], Oliver Khabiri[4], Olaf Van Leeuwen[5], Bernard Been[5], And Mark Burleigh[6]

[1]*PDB, Germany*

[2]*Audi AG, Germany*

[3]*BMW AG, Germany*

[4]*Cellbond UK, United Kingdom*

[5]*Humanetics, Netherlands*

[6]*Humanetics, United Kingdom*

PEER REVIEW PAPER No. ESV26-008

Modification and Validation of a Finite Element Model of a Pedestrian Dummy

Hiroyuki Asanuma[1], Yasuaki Gunji[1], Fumie Mori[2], Akiko Nagashima[2]
[1]*Honda R&D Co., Ltd. (Hiroyuki Asanuma, Yasuaki Gunji)*
[2]*Honda Techno Fort Co., Ltd. (Fumie Mori, Akiko Nagashima)*
Japan

PAPER No. ESV26-218

Anthropometric Targets for the Average Female: Preliminary Evaluations

Jobin John[1], Chiara Fichera[1], Tommy Pettersson[2], Mats Svensson[1], **Astrid Linder**[1 2 3]
[1]*Chalmers University of Technology, Department of Mechanical Engineering, Vehicle Safety Division, Sweden*
[2]*Swedish National Road and Transport Research Institute (VTI), Sweden*
[3]*Monash University Accident Research Center, Melbourne, Australia*

PAPER No. ESV26-239

Development of Web-based Signal Analysis Tools for the Modernized NHTSA Crash Test Database

Tanner Filben[1], James Gaewsky[1], Ryan Barnard[2], Sarah Crimmins[1], Bobby Amoroso[2], Alison Henry[2], Matthew Davis[1], Dan Parent[3], Patrick Smith[3], F. Scott Gayzik[2]
[1]*Elemance, LLC, Winston-Salem, NC*
[2]*Wake Forest University School of Medicine, Winston-Salem, NC*
[3]*National Highway Traffic Safety Administration, Washington, DC*

PAPER No. ESV26-260

DADSS In-Vehicle Simulated Breath Test Device: Development And Performance Assessment

TIMOTHY ALLEN[1], KIANNA PIROOZ[1], PETER NOVELLO[1], **ABDULLATIF K. ZAOUK**[1], ANTHONY PIRROTTA[1], HANI KAMAREDDINE[1], DANTE MANNELLO[1], DAVID LANG[1], SCOTT E. LUKAS[2], ROBERT STRASSBURGER[3]

[1]KEA Technologies Inc., United States

[2]Behavioral Psychopharmacology Research Laboratory (BPRL), McLean Hospital, United States

[3]Automotive Coalition of Traffic Safety, United States

PAPER No. ESV26-236

Evaluating Crash Test Dummy Motion From Internal Sensors in a Whiplash Test Use Case

MATTIAS HJORT[1]*, CHRISTIAN HOWARD[1], MATS SVENSSON[2], **ASTRID LINDER**[1 2 3]

[1]Swedish National Road And Transport Research Institute (VTI), Sweden

[2]Vehicle Safety Division, Chalmers University Of Technology, Sweden

[3]Monash University Accident Research Centre, Australia

Part A: ADAS for Crash Avoidance and Mitigation: Innovative and Emerging Technologies

Thursday, May 14, 2026 | 14:00 – 18:00

Co-chair: Dominique Charlebois, Canada| Co-Chair: Fabrizio Minarini, European Commission

TRACK B4 | Room: 206 C/D

Advanced Driver Assistance Systems (ADAS) focused on crash avoidance and mitigation, are continuing to progress in both capability and market share, with increasing availability across product lines, from value-focused to luxury brands, and some systems becoming standard equipment on models. These systems may provide driver warnings and active intervention in the longitudinal and/or lateral directions in crash imminent scenarios, based on system perception of other road actors, including vehicles and vulnerable road users, roadway characteristics and conditions. Some examples of ADAS features focused on crash avoidance and mitigation include the following: forward collision warning, automatic emergency braking, pedestrian automatic emergency braking, lane departure warning, lane keeping assistance, blind spot warning, blind spot intervention, and rear cross-traffic alert. In addition, innovative and emerging technologies are being developed to improve real-world system performance and help address other challenging crash imminent scenarios to increase potential safety benefits.

This session invites papers related to ADAS crash avoidance and mitigation systems, particularly innovative and emerging technologies. The intent of the session is to cover a broad range of relevant research in the field, which may include some of the following areas: advanced perception sensors; object detection and classification algorithms; perception system training for real-world robustness; methods to identify and reduce real-world false positives and negatives; virtual testing methods including simulation and XIL; closed track testing methods including test surrogates and equipment; on-road testing methods including field tests and operational safety monitoring; crash data analysis, scenario characterization, and safety benefits estimation; technology advancements to improve system performance for established and new scenarios (e.g. pedestrian, bicycle, motorcycle, other vulnerable road users, intersection, head-on, nighttime, weather, speeding); user acceptance, effectiveness, and potential unintended consequences.

PEER REVIEW PAPER No. ESV26-004

Characterization of Lane Keeping and Departure Scenarios Using Large Scale Naturalistic Driving Data

Gibran Ali[1], Paolo Terranova[1], Vicki Williams[1], Dustin Holley[1], Josh Saffy[1], Jacobo Antona-Makoshi[1], Kevin Kefauver[1], Emily Shull[2], Eric Li[2], Michael Venegas[2]

[1]*Virginia Tech Transportation Institute, United States*

[2]*National Highway Traffic Safety Administration, United States*

PEER REVIEW PAPER No. ESV26-047

SAE Level 2 ADAS Performance in Specific Crash-Imminent Scenarios

Gregory Beale[2], Kevin Kefauver[2], Michael Venegas[1], Eric Li[1], Jay Chen[1], Steven Huggins[3], Balachandar Guduri[2], Eddy Llaneras[2]

[1]*National Highway Traffic Safety Administration (NHTSA)*

[2]*Virginia Tech Transportation Institute (VTTI)*

[3]*Global Center for Automotive Performance Simulation (GCAPS)*

PEER REVIEW PAPER No. ESV26-105

Characterization of Pedestrian Automatic Emergency Braking Acceleration in the Modern Fleet: Potential Implications for Occupant Safety

Maitland Witmer[1 2], David Kidd[3], Valentina Graci[1 2]

[1]*Center for Injury Research And Prevention, Children's Hospital Of Philadelphia, Pennsylvania, United States*

[2]*Department Of Biomedical Engineering And Sciences, Drexel University, Philadelphia, Pennsylvania, United States*

[3]*Insurance Institute For Highway Safety, Ruckersville, Virginia, United States*

PAPER No. ESV26-018

Methodology and Tool for Quantifying the Safety Impacts of Incorporating V2X to ADAS for Collision Avoidance

Camila Correa-Jullian[1], Ali Mosleh[1], Dongfeng Zhu[1], Jiaqi Ma[1]

[1]*University of California Los Angeles, United States*

PAPER No. ESV26-130

Road Safety and ADAS: Mission Accomplished? AEB and LSS Show Safety Benefit But There Is Still Room For Improvement

Matthias Kuehn[1], Jenoe Bende[1], Isabella Aleshina-Baerwald[2], Marco Mario Lutze[2], Gerd Mueller[3]

[1]*German Insurers Accident Research*

[2]*Verkehrsunfallforschung An Der TU Dresden GmbH (VUFO)*

[3]*Technische Universität Berlin*

Germany

PAPER No. ESV26-138

Critical Scenarios to Assess Lane-Keeping Assistance: Integrating National Crash Data and Naturalistic Driving Data

Jacobo Antona-Makoshi[1], Gibran Ali[1], Kaye Sullivan[1], Vicki Williams[1], Lisa Frame[1], Tony Laituri[1], David Kizyma[1], Luke Neurauter[1], Michael Venegas[2], Eric Li[2]

[1]*Virginia Tech Transportation Institute, United States of America*

[2]*National Highway Traffic Safety Administration, United States of America*

REFRESHMENT BREAK

PAPER No. ESV26-145

Effects of Blue Light on ADAS Object Detection

Dominic Tough[1], Yousif Al-Ani[1], Jacqueline Paris[1]
[1]*Thatcham Research, United Kingdom*

PAPER No. ESV26-153

Effectiveness of Advanced Driver Assistance Systems in Injury Crashes

David Gorman[1], Tc Anwyll[1], Tudor Masek[1], Chris Roberts[1], Emily Burton[2], Chou-Lin Chen[3], Tim Pickrell[3], Chris Wiacek[3], Michael Cuson[4], Carol Flannagan[5], Andrew Leslie[5], Mike Janca[6], Jennifer Morrison[6], Tim Keon[7], Susan Owen[8], Craig Pattinson[9], Schuyler St. Lawrence[10], Karen Tadd[11], Hiro Tanji[12], **Ed Thai**[13], Sam Toma[14]
[1]*The Mitre Corporation, United States*
[2]*Honda North America, United States*
[3]*National Highway Traffic Safety Administration, United States*
[4]*Stellantis, United States*
[5]*University Of Michigan Transportation Research Institute, United States*
[6]*Mazda North America, United States*
[7]*Subaru Of America, United States*
[8]*General Motors LLC, United States*
[9]*Ford Motor Company, United States*
[10]*Toyota North America, United States*
[11]*Hyundai Motors, United States*
[12]*Mitsubishi Motors, United States*
[13]*Kia Motors, United States*
[14]*Volpe National Transportation Systems Center, United States*

PAPER No. ESV26-154

Real-world effectiveness of Advanced Driver Assistance Systems using FARS

David Gorman[1], Tc Anwyll[1], Kate Berman[1], Tudor Masek[1], Emily Burton[2], Chou-Lin Chen[3], Tim Pickrell[3], Chris Wiacek[3], Michael Cuson[4], Carol Flannagan[5], Andrew Leslie[5], Mike Janca[6], Jennifer Morrison[6], Tim Keon[7], Susan Owen[8], Craig Pattinson[9], Schuyler St. Lawrence[10], Karen Tadd[11], Hiro Tanji[12], **Ed Thai**[13], Sam Toma[14]

[1]*The Mitre Corporation, United States*

[2]*Honda Development & Manufacturing Of America, United States*

[3]*National Highway Traffic Safety Administration, United States*

[4]*Stellantis, United States*

[5]*University Of Michigan Transportation Research Institute, United States*

[6]*Mazda North America, United States*

[7]*Subaru Of America, United States*

[8]*General Motors LLC, United States*

[9]*Ford Motor Company, United States*

[10]*Toyota Motor North America, United States*

[11]*Hyundai Motors, United States*

[12]*Mitsubishi Motors, United States*

[13]*Kia Motors, United States*

[14]*Volpe National Transportation Systems Center, United States*

PAPER No. ESV26-169

Effect of the Robustness Layers Defined by Euro NCAP for the New Crash Avoidance 2026 Protocol on Perception Capabilities of Vehicle Sensors

Marc Perez[1 2], **Andres Aparicio**[1], Jonathan Batlle[1], Marc Llao[1], Adriano Palao[3]
[1]*Applus+ IDIADA, Spain*
[2]*Institut De Robòtica I Informàtica Industrial CSIC-UPC, Spain*
[3]*Euro NCAP, Belgium*

PAPER No. ESV26-181

Repeatability, Reproducibility, and Sameness in Heavy Vehicle AEB Testing

Cody Harris[1], Blaine Ricketts[1], Adam Frishkorn[2], And Michelle Fowler[1]
[1]*Transportation Research Center, Inc., United States*
[2]*National Hghway Traffic Safety Administration, United States*

PAPER No. ESV26-222

Fatalities Involving Modern Passenger Cars with Advanced Driver Assistance Systems – What Can In-Depth Studies Tell Us?

Maria Rizzi[1], **Johan Strandroth**[1], Rikard Fredriksson[2]
[1]*Strandroth Incorporated, Sweden*
[2]*Swedish Transport Administration, Chalmers University Of Technology, Sweden*
[3]*Johns Hopkins Bloomberg School Of Public Health, USA*

PAPER No. ESV26-256

From Data to Road Safety: Advancing car-to-pedestrian AEB Test Scenarios

MATS PETERSSON[1], **STEPHAN RYRBERG**[1], JORGE LORENTE MALLADA[2], PALOMA DÍAZ FERNÁNDEZ[3], YURY TARAKANOV[4], MAGDALENA LINDMAN[5], ANDERS YDENIUS[6]

[1]*RISE AstaZero AB, Sweden*

[2]*Toyota Motor Europe NV/SA, Belgium*

[3]*Volvo Car Corporation, Sweden*

[4]*Viscando AB, Sweden*

[5]*If P&C Insurance Ltd, Sweden*

[6]*Folksam Insurance Group, Sweden*

PAPER No. ESV26-015

Improvements in Autonomous Emergency Braking Systems After Regulation Amendment

FABRIZIO RE[1], CHRISTIAN BONATO[1], DALIA BROGGI[1], ANTONELLO CHERUBINI[2], RICCARDO DONÀ[1], AKOS KRISTON[1], FABRIZIO MINARINI[1], GIULIA MORANDIN[1]

[1]*European Commission, Joint Research Centre (JRC), Smart Sustainable and Safe Transport Unit, Ispra, Italy*

[2]*University of Bologna, Department of Mechanics, Bologna, Italy*

New and Improved Field Data Collection, Analysis, and Benefits Assessment Methods

Thursday, May 14, 2026 | 14:00 – 18:00

Co-chair: Thomas Belcher, Australia| Co-Chair: Matthew Craig, U.S.

TRACK C4 | Room: 200 A/B/C

Crash data plays a crucial role in enhancing vehicle safety by informing research, policy development, regulations, and testing procedures. These data also play a leading role in the development of crash prevention and crash protection countermeasures. However, due to the rapid proliferation of advanced driver assistance systems (ADAS), the collection and analysis of data from these technologies needs to evolve to better understand the real-world performance and to quantify the benefits and limitations of these technologies. Data collected on event data recorders (EDRs), data loggers, or over-the-air transmissions during both crash and non-crash events will undoubtedly enable new research opportunities. Also, several naturalistic studies and testing of ADAS and Automated Driving Systems (ADSs) are in progress in various regions of the world that will provide additional insight into how crashes occur, providing additional information on prevention. Worldwide, data collection programs in Asia, Europe, Australia, and the United States. are being used more to drive research and facilitate informed decisions. This session invites papers aimed at a discussion of novel data collection and analysis methods. Papers related to such topics as telematics, on-board and off-board data recorders, naturalistic driving data, crash avoidance technologies, levels of driving automation, and crash reconstruction are welcome in this session. Also, papers on analytical methods for evaluating safety performance of new technologies are invited.

PEER REVIEW PAPER No. ESV26-060

Characterization of Front Row Occupants Involved in Motor Vehicle Crashes Compared to ATDs and the U.S. Population

Elizabeth McNeil[1], Rodney Rudd[1], Matthew Craig[1]

[1]*National Highway Traffic Safety Administration, United States*

PAPER No. ESV26-188

Integrating Telematics and Field Data to Improve Insights to Reduce Traffic Fatalities

Maki Nagano[1], Akiko Fukui[1], Jennifer Morrison[2], Kosuke Mukaigawa[1], Takahiro Narikawa[1], Taei Shibahara[1], Hiromu Shibasaki[1]

[1]*Mazda Motor Corporation, Japan*

[2]*Mazda North American Operations, United States*

PEER REVIEW PAPER No. ESV26-022

Validation of Vehicle-Based Injury Severity Prediction Using Crash Telemetry Data

Susumu Ejima[1], Peng Zhang[2], Kristine Cunningham[2], Stewart Wang[2]

[1]*Subaru Corporation, Japan*

[2]*University of Michigan International Center for Automotive Medicine, United States*

PAPER No. ESV26-191

Study on Evaluation of D-Call Net Injury Prediction Algorithm Using Japanese and German In-Depth Accident Databases

Toru Kiuchi[1], Henrik Liers[2], Tetsuya Nishimoto[3], And Tadafumi Shima[4]

[1]*Institute for Traffic Accident Research And Data Analysis (ITARDA), Japan*

[2]*Verkehrsunfallforschung An Der TU Dresden GmbH (VUFO), Germany*

[3]*Nihon University, Japan*

[4]*Ministry Of Land, Infrastructure, Transport And Tourism, Japan*

PEER REVIEW PAPER No. ESV26-012

Advanced Tool for Traffic Crash Analysis: An AI-Driven Multi-Agent Approach to Pre-Crash Reconstruction

Shan Bao[1], Gerui Xu[1], Boyou Chen[1], Huizhong Guo[1], Dave LeBlanc[2], Arpan Kusari[2], Efe Yarbasi[2], Ananna Ahmed[2], Zhaonan Sun[2]

[1]*University of Michigan, United States*

[2]*Toyota North America, United States*

PAPER No. ESV26-021

The Relationship Between Vehicle Travel Speed, Impact Speed, and Delta-V in Different Crash Types

Sam Doecke[1], Jamie Mackenzie[1], Matthew Baldock[1], And Jeffrey Dutschke[2]

[1]*Centre For Automotive Safety Research, The University Of Adelaide, Adelaide, Australia*

[2]*Anderson Hall Pty Ltd, Adelaide, Australia*

REFRESHMENT BREAK

PAPER No. ESV26-065

Estimating Motorcycle Impact Speed in Fatal Car Collisions Using Matching Real-World Deformation with Simulation Catalogue

SITI ATIQAH MOHD FAUDZI[1], ZARIR HAFIZ ZULKIPLI[1], D-WING KAK[1], **TOSHIYUKI YANAOKA**[2], PRADEEP PUTHAN[3], AND TETSUYA MATSUSHITA[4]

[1]*Malaysian Institute of Road Safety Research (MIROS)*

[2]*Honda R&D Co., Ltd.*

[3]*Autoliv Asia ROH Co. Ltd., Bangkok, Thailand*

[4]*Autoliv Japan Ltd*

PAPER No. ESV26-293

Modelling Impact Speed for Powered Two-Wheeler Crashes in Malaysia Using In-Depth Data From India

D-WING KAK[1], ZARIR HAFIZ ZULKIPLI[1], SITI ATIQAH MOHD FAUDZI[1], PRADEEP PUTHAN[2], TOSHIYUKI YANAOKA[3], JOLYON CARROLL[4], AND **TETSUYA MATSUSHITA**[5]

[1]*Malaysian Institute of Road Safety Research (MIROS)*

[2]*Autoliv Asia ROH Co. Ltd., Bangkok, Thailand*

[3]*Honda R&D Co., Ltd.*

[4]*Autoliv Development AB, Sweden*

[5]*Autoliv Japan Ltd.*

PAPER No. ESV26-042

Validation of Event Data Recorder Speed Measurements in Real-World Crashes for Forensic Analysis

Alireza Jafari Anarkooli[1], Theunis Botha[2], Jason Bayley[1], Brian Hsu[1]

[1]*Collision Sciences Inc., Toronto, Canada*

[2]*Collision Sciences Inc., Cape Town, South Africa*

PAPER No. ESV26-208

Estimation of the Effectiveness of Autonomous Emergency Braking in Rear-End Collisions Using a Simulation-Based Method

Mitsuaki Goto[1], Takao Matsuda[1], Yuichi Kitagawa[1], Shotaro Yamasaki[2], And Yuri Shirakura[2]

[1]*Toyota Motor Corporation, Japan*

[2]*Aioi Nissay Dowa Insurance Co., Ltd., Japan*

PAPER No. ESV26-252

Building Scientific Consensus on the Crash Safety Performance of Automated Driving Systems

John M. Scanlon[1], Kristofer D. Kusano[1], Timothy L. McMurry[1], Tilia Gode[1], Trent Victor[1]

[1]*Waymo, LLC, United States*

PAPER No. ESV26-264

A Computer Vision and Generative AI-Based Pipeline for Secure Driver Face Video Deidentification in Naturalistic Driving Data

Surendrabikram Thapa[1], Abhijit Sarkar[1], Julie McClafferty[1], Zeb Bowden[1], Miguel Perez[1 2], **Thomas Fincannon**[3], Starla M. Weaver[3]

[1]*Virginia Tech Transportation Institute, Virginia Tech, United States*

[2]*Biomedical Engineering Department, Virginia Tech, United States*

[3]*National Highway Traffic Safety Administration, United States*

PAPER No. ESV26-279

Public Crash Video Evidence for Adapting Euro NCAP Intersection Scenarios to North America

Krzysztof Czarnecki[1]

[1]University of Waterloo, Canada

PAPER No. ESV26-282

Collection of Naturalistic Data for Bicycle-Vehicle Interactions in Intersection Scenarios

Christoph Klas[1], Tobias Moers[1], And Adrian Zlocki[1]

[1]*Fka GmbH, Germany*

Crash Protection for Children

Friday, May 15, 2026 | 08:30 – 12:30

Co-chair: Jim Hand, U.K.| Co-Chair: Yoshinori Tanaka, Japan
TRACK A5 | Room: 200 A/B/C

The effectiveness of safety systems is influenced by anthropometry, sex, and age, as well as other characteristics of the occupant. This session will cover computational, experimental, and field studies as they relate to injuries of children. Papers are encouraged that discuss the safety considerations by age, sex, and size and strategies to protect diverse populations. Topics can also include the evaluation of safety systems such as child restraints and aftermarket products.

PEER REVIEW PAPER No. ESV26-101

Comparison of CRS Rebound with and Without Anti-Rebound Features in Frontal Crashes

Suzanne Tylko[1], Kathy Tang[1]
[1]*Transport Canada, Canada*

PAPER No. ESV26-284

Effect of Seat Belt Pretensioner on Forward-Facing Child Restraint Systems (CRS) With And Without Installation Errors in Frontal Impacts

Julie Mansfield[1], Gretchen Baker[1]

[1]*Injury Biomechanics Research Center, School Of Health And Rehabilitation Sciences, College Of Medicine, The Ohio State University Wexner Medical Center, Columbus, OH, United States*

PAPER No. ESV26-271

Effect of Anti-Rotation Device Configuration on ISOFIX Child Restraint System Interaction With The Vehicle Seat Cushion

Costandinos Visvikis[1], Nilesh Katkar[1]

[1]*Cybex GmbH, Germany*

PEER REVIEW PAPER No. ESV26-010

Assessing the Influence of Reclined Vehicle Seatback Configurations With and Without a Belt-Positioning Booster on Child Posture via Pressure Mapping

Gretchen Baker[1], Rosalie Connell[2], Valentina Graci[3], Julie Mansfield[1]

[1]*Injury Biomechanics Research Center, The Ohio State University, United States*

[2]*Lafayette College, United States*

[3]*Drexel University and The Children's Hospital of Philadelphia, United States*

PAPER No. ESV26-203

Influence of Seatback Recline on Crash Performance of Child Restraint Systems in Frontal Impact

Bianca Albanese[1 2 3], Byron Panos[1 4], Tom Whyte[1], Hannah Cook[1], Hee Loong Wong[5], Jae Min Chun[6], Lynne Bilston[1 4], Julie Brown[1 2 3]

[1]*Neuroscience Research Australia, Australia*

[2]*School Of Population Health, University Of New South Wales, Australia*

[3]*The George Institute For Global Health, Australia*

[4]*School Of Biomedical Engineering, University Of New South Wales, Australia*

[5]*Hyundai Motor Company Australia, Australia*

[6]*Hyundai Motor Company, Korea*

PEER REVIEW PAPER No. ESV26-076

Front-Row Seatback Contact for Paediatric Occupants Seated in Rearward-Facing Infant Child Restraint Systems During Frontal Crashes

Declan A. Patton[1], Kathy Tang[2], Suzanne Tylko[2], Kristy B. Arbogast[1]

[1]*Center for Injury Research and Prevention, Children's Hospital Of Philadelphia; Perelman School Of Medicine, University Of Pennsylvania, United States*

[2]*Centre For Innovation, Transport Canada, Canada*

PAPER No. ESV26-062

The Effect of Front Seat Performance on Rear Seated Children in High Speed Rear Impacts

Steven E. Meyer[1], Davis Hock[1], Jeremy McMillin[1], Laurie Labounty[1]

[1]*Safety Analysis and Forensic Engineering (S.A.F.E.), L.P., SAFE Laboratories, L.L.C.*

PAPER No. ESV26-237

Driving Change: Building Real World Safety Capacity with Accessible Child Passenger Safety Education

Emma Daughton[1], Jen Shapka[1], Katherine Hutka[1 2], And Holly Choi[1]

[1]*Child Passenger Safety Association of Canada, Canada*

[2]*IWK Health Centre for Women and Children, Child Safety Link, Halifax, Canada*

REFRESHMENT BREAK

PAPER No. ESV26-235

Enhancing Child Passenger Safety Through Evidence-Based Legislative Reform in Canada

Katherine Hutka[1 2], Emma Daughton[1], Jen Shapka[1]

[1]*Child Passenger Safety Association of Canada, Canada*

[2]*IWK Health Centre for Women and Children, Child Safety Link, Halifax, Canada*

PAPER No. ESV26-216

A Review of All Child Car Occupant Fatalities In Sweden From 1992 to 2024

Katarina Bohman[1], Anna Carlsson[2], Maria Klingegård[3], Isabelle Stockman[1], Lotta Jakobsson[1 4], Rikard Fredriksson[4 5]

[1]*Volvo Cars, Sweden*

[2]*Chalmers Industriteknik, Sweden*

[3]*Folksam, Sweden*

[4]*Chalmers University Of Technology, Sweden*

[5]*Trafikverket (Swedish Transport Administration), Sweden*

PAPER No. ESV26-291

Nova Scotia Child Passenger Restraint Use In Vehicles: An Observational Roadside Survey

Tanner Van Every[1], Katherine Hutka[2], Alexa Davis[1], Gabriella Ilie[1], Natalie Yanchar[3], Mark Asbridge[1]

[1]*Faculty of Community Health And Epidemiology, Dalhousie University, Halifax, Canada*

[2]*IWK Health Centre For Women And Children, Child Safety Link, Halifax, Canada*

[3]*Department Of Surgery, Cumming School Of Medicine; Alberta Children's Hospital Research Institute, University Of Calgary, Canada*

PAPER No. ESV26-030

Evaluating the Transmission of Ambulance Vibration to Neonatal Transport Systems and Patients

Keely Gibb[1], Michael Avarello[1], Eleanor Gerson[2], Kim Greenwood[2], Jean Ngoie[2], Stephanie Redpath[2], Adrian D.C. Chan[1], James R. Green[1], and Robert G. Langlois[1]

[1]*Carleton University, Ottawa, Canada*

[2]*Children's Hospital of Eastern Ontario, Ottawa, Canada*

Part B: ADAS for Crash Avoidance and Mitigation: Innovative and Emerging Technologies

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Friday, May 15, 2026 | 08:30 – 12:30

Co-chair: Anna Wrige Berling, Sweden| Co-Chair: Patrick Seiniger, Germany

TRACK B5 | Room: 206 C/D

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PEER REVIEW PAPER No. ESV26-090

An Investigation of Drowsy Lane Departure from Driving Simulator Studies

Chris Schwarz[1], John Gaspar[1], Emily Shull[1], Michael Venegas[1]

[1]*The University Of Iowa, Driving Safety Research Institute, United States*

PAPER No. ESV26-089

Robust AI–Based Deer Detection for ADAS in Adverse Weather Conditions

Silas Scholz[1], Thomas Ochsner[1], Christoph Rohmann[1], Harald Bachem[1]

[1]*Ostfalia University Of Applied Sciences, Wolfsburg 38440, Germany*

PAPER No. ESV26-115

Vehicle Safety Apparatus-Improving Vehicle PNT In Tight Lanes

Patrick Moraca[1]

[1]*SAI-NAV, LLC (Inventor & Owner); P.E. Environmental Engineering, Arizona; P.E. Civil Engineering (Various States); NCEES; B.S. Electrical Engineering; IIT Carnations, USDOT Tier 1 Center (Tech Transfer Board Member 2026); United States*

PAPER No. ESV26-116

Improving Motorcycle Safety with Advanced Braking Systems: Findings from Track Tests

Benoit Anctil[1], Dominique Charlebois[1], Amy Oke[1], Marc-Antoine Lalonde[2], Guillaume Pierre[2]
[1]*Transport Canada, Canada*
[2]*PMG Technologies Inc., Canada*

PAPER No. ESV26-174

Development and Validation Methodology of a Strikable Heavy Truck Trailer Surrogate

Joseph Kelly[1], **Jordan Silberling**[1], Sebastian Silvani[2], Alrik Svenson[2]
[1]*Dynamic Research, Inc., United States*
[2]*National Highway Traffic Safety Administration, United States*

PAPER No. ESV26-227

Using a Guided Soft Target for Human Factors Research with Surprise Events: A Methodology Review

Luke Neurauter[1], Marty Miller[1], Laura Hamm[1], Joe Kelly[2], Jordan Silberling[2], Yi Glaser[3], Kevin Hoang[3], Carl Darukhanavala[3], Chad Zagorski[3], and Mike Carpenter[3]
[1]*Virginia Tech Transportation Institute, United States*
[2]*Dynamic Research, Inc., United States*
[3]*General Motors, United States*

PAPER No. ESV26-258

DADSS Passive Breath Sensor Measurement Algorithm Considerations, Tradeoffs, and Performance Assessment Methodology

Timothy Allen[1], Peter Novello[1], Kianna Pirooz[1], **Abdullatif K. Zaouk**[1], Sarah Seidman[1], Jacqueline Early[1], Rudra Patel[1], Scott E. Lukas[2], Rebecca Spicer[3], Colin Fergus[3], And Robert Strassburger[4]

[1]*KEA Technologies Inc., United States*

[2]*Behavioral Psychopharmacology Research Laboratory (BPRL), McLean Hospital, USA*

[3]*Impact Research, United States*

[4]*Automotive Coalition of Traffic Safety, United States*

PAPER No. ESV26-261

The Effect of Lidar Congestion on ADAS/ADS Operation

Matt Palmer[1], Loren Stowe[1], Ryan Mott[1], Steven Huggins[2], Stephen Stasko[3]

[1]*Virginia Tech Transportation Institute (VTTI), United States*

[2]*Global Center For Automotive Performance Simulation (GCAPS), United States*

[3]*National Highway Traffic Safety Administration (NHTSA), United States*

REFRESHMENT BREAK

PAPER No. ESV26-270

Effect of Prediction Errors on Crash Avoidance in Straight-Crossing-Path Scenarios

Luke E. Riexinger[1], David G. Kidd[1], Becky Mueller[1], Sushant Jagtap[1], Jessica S. Jermakian[1]
[1]*Insurance Institute for Highway Safety, USA*

PAPER No. ESV26-280

Blinded by the Light – The Effects of Vehicle Headlight Glare on Nighttime Driving

Caroll Lau[1], Peter C. Burns[1], Joanne Harbluk[1], Benoit Anctil[1], Dominique Charlebois[1]
[1]*Transport Canada, Canada*

PAPER No. ESV26-277

A Reconstruction Story: How Technology Could Reduce Risks to Vulnerable Road Users in the Real World

Dominique Charlebois[1], Benoit Anctil[1], Julien Dufort[1], Amy Oke[1], Guillaume Pierre[2], Guillaume Bergeron[2], and Marc-Antoine Lalonde[2]
[1]*Transport Canada, Canada*
[2]*PMG Technologies Inc., Canada*

PAPER No. ESV26-134

76-77 GHz Automobile Radar Range-Point-Cloud and Range-Velocity Dataset for Micro-Doppler-Based VRU Detection Algorithm Development

SIDDHARTH MURALI[1], SHAIL DESAI[1], JUE ZHOU[1], **STANLEY CHIEN**[1], YAOBIN CHEN[1], CHI-CHIH CHEN[2], ANANNA AHEMED[3], RINI SHRONY[3]

[1]*Transportation And Autonomous Systems Institute, Purdue University*

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PAPER No. ESV26-158

Influence of AEB-Caused Pitching On Passive Pedestrian Test Provisions

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Current Topics in Crashworthiness Research

Friday, May 15, 2026 | 08:30 – 12:30

Co-chair: Aloke Prasad, U.S.| Co-Chair: Elizabeth McNeil, U.S.

TRACK C5 | Room: 206 A/B

Advances in vehicle structures, restraints, and better understanding of crash environments and human injury tolerance has led to significant improvements in crash protection over the last four decades. This session has papers from other crashworthiness related session topics, including protection in front, side and rear crashes, experimental and computational advances in biomechanics, virtual testing, new and improved field data collection, and protection of non-occupant road users.

PEER REVIEW PAPER No. ESV26-033

Regional-Specific Patterns of Abdominal Injury in Belted Male and Female Frontal Crash Occupants: Insights from Redefined Anatomical Mapping

Dale Halloway[1], William Curry[1], Karthik Somasundaram[1], Frank Pintar[1]

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PEER REVIEW PAPER No. ESV26-077

Assessing Injury Prediction with Human Body Models: Application to Rib Fracture Risk Prediction Using SAFER HBM

Bengt Pipkorn[1,2], Yash Niranjan Poojary[2], Jonas Osth[1], Karl-Johan Larsson[3], and Johan Iraeus[2]

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PAPER No. ESV26-034

Injury Risk Assessment for Average Males and Females in Full Frontal Impact using Computational Human Body Models

VIKAS HASIJA[1], TEJAS RUPAREL[2], **MATTHEW J. CRAIG**[1]

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[2]Bowhead Mission Solutions, United States

PAPER No. ESV26-113

Potential Influence of the Frontend Geometry of Passenger Cars on Trajectories and Injury Severities in Pedestrian Crashes

OLIVER ZANDER[1], TOBIAS LANGNER[1]

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PAPER No. ESV26-163

Investigating the Influence of the 3D Muscle Representation With Hybrid Active Properties in the Ansys Hans Human Body Model for Vehicle Safety Applications

MUKUND THIRUGNANASAMBANTHAR[1], ALEXANDER GROMER[1], MICHAEL DITTHARDT[2], CHRISTIAN KLEINBACH[2], OLEKSANDR V. MARTYNENKO[3], SYN SCHMITT[3]

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PAPER No. ESV26-165

Impact of External Geometric Variation of Human Ribs on Biomechanical Response

Cristian Saenz-Betancourt[1,2], Dustin Draper[1], Philipp Wernicke[1], Yun-Seok Kang[3], Steffen Peldschus[2], And Amanda M. Agnew[3]

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PAPER No. ESV26-275

Development of an Open Source FE Head Model to Address Diversity Aspects in Head Trauma

Robert Thomson[1], Jobin John[1], Yash Niranjan Poojary[1], Aleksandra Krusper[1], Jia-Cheng Xu[2], Yong Han[3]

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PEER REVIEW PAPER No. ESV26-046

Biomechanical Responses and Injuries of Male Post-Mortem Human Subjects in Rear-Facing Frontal Impacts With Unreinforced Airbag-Equipped Production Seats

Yun-Seok Kang[1], Timothy DeWitt[1], Timothy Wensink[1], Angelo Marcallini[1], Yong Hyun Jung[2], Dong Gil Lee[2], Jae Jun Harm[2], Seokhoon Ko[2], Randee Hunter[1], Amanda M. Agnew[1]

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REFRESHMENT BREAK

PEER REVIEW PAPER No. ESV26-054

Rear-Impact Crash Injury Patterns and Predictors: Insights from Contemporary CISS and CIREN Field Data

JACK LOCKERBY[1], **RODNEY RUDD**[1]
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PAPER No. ESV26-059

Unseen Risks in the Rear: Injury Potential in High Occupancy Vehicles During Rear-End Crashes

WILLIAM MCGOWAN[1], KEVIN BROGAN[1], AND MARC NELSON[1]
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PAPER No. ESV26-063

Head Restraint Design and Failure in Moderate to High-Speed Rear Impact Collisions

STEVEN E. MEYER[1], JEREMY MCMILLIN[1], DAVIS HOCK[1], LAURIE LABOUNTY[1]
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