TRB *PRESENTATIONS*

1st International Roadside Safety Conference

Safer Roads, Saving Lives, Saving Money

June 12-15, 2017
Holiday Inn Golden Gateway, San Francisco, California

Organized by
Transportation Research Board

Sponsored by
TRB Standing Committee on Roadside Safety Design (AFB20)

Co-Sponsored by
Transportation Pooled Fund Program Project No. TPF-5(329), including US State Departments of Transportation for Kentucky, Minnesota, Nebraska, Ohio, Washington, and West Virginia

The National Academies of
SCIENCES · ENGINEERING · MEDICINE
TRANSPORTATION RESEARCH BOARD

Monday, June 12

7:00 a.m. - 5:30 p.m., Emerald Foyer
Registration

8:00 a.m. - 9:30 a.m., Emerald Ballroom
General Session 1
Moderators: Ronald Faller, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska; Stephen Maher, Transportation Research Board; Roger Bligh, Texas A&M Transportation Institute, College Station, Texas

Keynote Address: A Complete Simulation Ecosystem - LS-DYNA
- **Jason Wang**, Developer, Livermore Software Technology Corporation, Livermore, CA

9:30 a.m. - 10:00 a.m., Lower Lobby Foyer
Break

10:00 a.m. - 11:45 a.m.
Technical Sessions

Session 1A, *Redwood*
Barrier Compatibility and Safety of Vulnerable Users
Moderator: Richard Albin, Federal Highway Administration, Olympia, Washington

Development of a MASH TL-2 Crashworthy Pedestrian Railing System
Ronald Faller, Midwest Roadside Safety Facility, University of Nebraska-Lincoln

Development of a Continuous Motorcycle Protection Barrier System using Computer Simulation and Full-Scale Crash Testing
Ali Atahan, Istanbul Technical University, Istanbul, Turkey

Vulnerable Road User Serious Injury Impacts Into W-Beam Barriers
Mario Mongiardini, Transport and Road Safety Research Centre (TARS), University of New South Wales (UNSW), Sydney, Australia

Making Roadsides Safer for Vulnerable Road Users
José A. Quintanilha , Escola Politécnica of Universidade de São Paulo, São Paulo, Brazil

Session 1B, *Emerald Ballroom*
Real-World Evaluation of Roadside Safety Countermeasures
Moderator: Don Fisher, Ohio Department of Transportation, Columbus, Ohio

Challenges and Opportunities For Improving The Safeside Procedure for Cost-Benefit Assessment of Roadside Safety Intervention Alternatives
Carlos Roque, Laboratório Nacional de Engenharia Civil, Departamento de Transportes, Lisbon, Portugal

Road Safety Audit & Proposal For Corridor Extension Plan: Case Study Barapullah Corridor, New Delhi, India
Namit Kumar, Rites Ltd, New Delhi, India

Standardization of Roadside Safety ISPE Processes Using Data Dictionary for Pre- and Post-Crash Information
Charles Stevens, Texas A&M Transportation Institute, College Station, Texas

Roadside Safety Hardware Framework Concept For Enhanced In-Service Performance Evaluation and Asset Management Practices
Charles Stevens, Texas A&M Transportation Institute, College Station, Texas

Session 1C, *Oregon/Nevada*

Safety Audits, Ratings, and Assessments

Moderator: Malcolm Ray, Roadsafe LLC, Canton, Maine

A Study of Applying Mobile Mapping Result for Road Safety Audit on Rural Roads in Thailand
Kawin Saiprasertkit, Department of Rural Roads, Bangkok, Thailand

Safe System Assessments of Roadside Safety Projects
Jamie Robertson, Safe System Solutions Pty Ltd, Victoria, Australia

Relationship between Roadside Hazard Rating and Crash Occurrence
Jonathan Wood, South Dakota State University, Brookings, South Dakota

Meeting the Challenge of the Decade of Action
Michael Dreznes, International Road Federation, Chicago, Illinois

Session 1D, *California/Washington*

Vehicle Performance on Special Terrain and Other Roadside Safety Considerations

Moderator: Roger Bligh, Texas A&M Transportation Institute, College Station, Texas

An Initial Investigation into Traversability of Rock Ditch Liners
Mojdeh Asadollahi Pajouh, Midwest Roadside Safety Facility- University of Nebraska-Lincoln, Nebraska
Testing & Analyses of Terrain Effects on Vehicle Trajectories & Kinematic
Dhafer Marzougui, Center for Collision Safety and Analysis, George Mason University, Fairfax, Virginia
Taxonomy of Roadside Safety Hardware
Malcolm Ray & Olaf Johnson, Roadsafe LLC, Canton, Maine

Safety Countermeasures for Roadway Departure Crashes: An Overview
Mohammad Jalayer, Center for Advanced Infrastructure and Transportation, Rutgers University, Piscataway, New Jersey

Noon - 1:30 p.m., Gold Rush Ballroom
Lunch

1:30 p.m. - 3:15 p.m.
Technical Sessions

Session 2A, *Emerald Ballroom*

Safety Considerations for Narrow Hazards - Utility Poles and Sign Supports

Moderator: Ronald Faller, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Development of Crashworthy Road Sign Post using Energy Absorbing Modules on the Sign Base Plate
Dukgeun Yun, Korea Institute of Civil Engineering and Building Technology, Gyeonggi-do, Korea

Development of Guidance for Minimum Sign Area for Slipbase Sign Supports
Roger Bligh, Texas A&M Transportation Institute, College Station, Texas

Consideration of Placement Criteria for Utility Poles to Minimize Crash Risk
Christine Carrigan, RoadSafe LLC, Canton, Maine

Utility Poles, Toleration or Confrontation
Don Ivey, Scientific Inquiry Inc., Bryan, Texas

Session 2B, *Redwood*

Vulnerable Road User Safety

Moderator: Rod Troutbeck, Troutbeck & Associates, Queensland, Australia

"See Me Save Me - Improving The Safety of Cyclists"
Harpreet Singh Dhunna, Avoid Accidents, Mohali, India

Protecting the Most Vulnerable: Which Safety Measures Generate Public Support for Paratransit and Bus Transportation?
Isabella Guajardo, University of Pennsylvania, Perelman School of Medicine, Pennsylvania

Making Roads (more) Motorcycle Friendly in New Zealand
Julian Chisnall, New Zealand Transport Agency, Wellington, New Zealand

Reducing Drink Driving in Cambodia : A Partnership Approach
Kong Sovann, Road Safety Consultant, Phnom Penh, Cambodia

Session 2C, *Oregon/Nevada*

Deformable Longitudinal Barriers - Performance, Challenges, and Innovations

Moderator: John Reid, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

MGS Dynamic Deflections and Working Widths at Lower Speeds
Mojdeh Asadollahi Pajouh, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Challenges in Developing Cost Effective MASH TL4 Semi-Flexible Barriers
Leigh Brown, Valmont Highway Technology, Sydney, Australia

New Zinc-Aluminum-Magnesium Metallic Coating for Guardrails
Richard Clausius, ArcelorMittal Global R&D, East Chicago, Indiana

New Thrie Beam Terminal End Shoe Connection
Akram Abu-Odeh, Texas A&M Transportation Institute, College Station, Texas

Session 2D, *California/Washington*

Vehicle and Hardware Evaluation Criteria – Alternative Methods and Compatability

Moderator: Chiara Silvestri Dobrovolny, Texas A&M Transportation Institute, College Station, Texas

Development and Validation of the Surrogate Vehicle used in ASTM F3016-14 Standard Test Method for Surrogate Testing of Vehicle Impact Protective Devices at Low Speeds
Dean Alberson, Texas A&M Transportation Institute (Retired), College Station, Texas

Evaluating Safety Hardware Identification Methods Durability using Crash Testing Opportunities
Charles Stevens, Texas A&M Transportation Institute, College Station, Texas

Correlation between Roadside Safety Hardware and Vehicle Safety Standards Evaluation Criteria
Nathan Schulz, Texas A&M Transportation Institute, College Station, Texas

***Using Event Data Recorders in Motor Vehicles to Better Understand Run Off the Road Crashes**
Kenute Hare, Ministry of Transport and Mining, Kingston, Jamaica (* Invited Presentation) ***3:15 p.m. - 3:45 p.m., Lower Lobby Foyer***

Break

3:45 p.m. - 5:30 p.m.
Technical Sessions

Session 3A, *Emerald Ballroom*

Bridge Railing Evaluation Through Analysis, FEA, or Physical Testing
Moderator: Marco Anghileri, Politecnico di Milano, Milan, Italy

Attachment of a Combination Bridge Rail to Concrete Parapet Utilizing Epoxy Adhesive Anchors
Robert Bielenberg, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Design and Evaluation of a Fascia Mounted Bridge Rail for Steel Bridges on Local Roadways
Chuck Plaxico, Roadsafe LLC, Canton, Maine

Design and Full-Scale Testing of New Retrofit Bridge Rail for 24.8-Mile Long Causeway Bridges Over Lake Pontchartrain, New Orleans, Louisiana
William Williams, Texas A&M Transportation Institute, College Station, Texas

MASH Equivalency of NCHRP 350-Approved Bridge Railings
William Williams, Texas A&M Transportation Institute, College Station, Texas

Session 3B, *Redwood*

Advancing Motorcyclist Safety Through Computer Simulation
Moderator: Jennifer Schmidt, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraksa

Development of a Motorcycle FE Model for Simulating Impacts into Roadside Safety Barriers
Mario Mongiardini, Transport and Road Safety Research Centre, University of New South Wales, Australia

Motorcycle Finite Element Computer Model to Assist with Roadside Safety Research Efforts
Nathan Schulz, Texas A&M Transportation Institute, College Station, Texas

Improvement of Hybrid III 50th percentile FE model for Sliding Configuration Motorcyclist Impact
Matteo Bernardini,Politecnico di Milano – Transportation Safety Lab – LaST, Milan, Italy

Upright Motorcycle Impacts against Roadside Safety Barrier: Rider Injury Risks and Countermeasure Investigation through FEA
Nathan Schulz, Texas A&M Transportation Institute, College Station, Texas

Session 3C, *Oregon/Nevada*

Roadway Departure Safety – Countermeasures, Rumble Strips, and Safety Edge
Moderator: John Donahue, Washington State Department of Transportation, Olympia, Washington

Safety Evaluation of Safety Edge Treatment in Iowa
Amrita Goswamy, Institute of Transportation, Iowa State University, Ames, Iowa

Investigating Effectiveness of Centerline Rumble Strips on Rural Two-Lane Roads in Louisiana with Empirical Bayes Method
M. Ashifur Rahman, University of Louisiana, Lafayette, Louisiana

Safety Impacts of the Safety Edge
Shauna Hallmark, Institute for Transportation at Iowa State University, Ames, Iowa

Session 3D, ***California/Washington***

Roadside Safety Countermeasures to Reduce Incidents

Moderator: Michael Dreznes, International Road Federation, Chicago, Illinois

Initial Developments Supporting a Roadside Tree Removal Marketing Campaign
Karla Lechtenberg, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Retrospective Look at 1998 Strategies to Improve Roadside Safety: Mission 2 – Build & Maintain Information Resources and Analysis Procedures
Kenneth Opiela, Center for Collision Safety and Analysis, George Mason University, Fairfax, Virginia

Traffic Stopped Ahead – Everything you Wanted to know about Work Zone Queue Warning Systems
Joseph Jeffrey, Road-Tech Safety Services, Inc., Shingle Springs, California

Reducing the Incidence of Impaired Driving Through Globally Effective Countermeasures
Danielle Comeau, Alcohol Countermeasure Systems Corp, Ontario, Canada

5:30 p.m. - 7:00 p.m., Gold Rush Ballroom
Reception with Exhibitors

Tuesday, June 13

8:00 a.m. - 4:00 p.m., Emerald Foyer
Registration

8:30 a.m. - 9:30 a.m., Emerald Ballroom
General Session 2
Moderator: ***Stephen Maher****, Transportation Research Board*

Keynote Address: Making Our Mission a Reality
- Malcolm Dougherty, Director, California Department of Transportation, Sacramento, CA and Chair, TRB Executive Committee

9:30 a.m. - 10:00 a.m., Gold Rush Ballroom
Break

9:30 a.m. - 3:45 p.m., Gold Rush Ballroom
Exhibits

10:00 a.m. - 11:45 a.m.
Technical Sessions

Session 4A, ***Emerald Ballroom***

Guidelines, Advances, and Ongoing Research into Wire-Rope Cable Barriers

Moderator: Don Fisher, Ohio Department of Transportation, Columbus, Ohio

High Tension Cable Barrier in the Median of a Freeway in Alberta, Canada: A Case Study of Two Successful Projects
Masood Hassan, Tetra Tech Canada Inc., Edmonton, Canada

Investigation and Mitigation of Post Penetration into Floorplan of 1100C Small Cars
Ronald Faller, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Recommended Updates to MASH for Testing of Cable Barrier Systems
Scott Rosenbaugh, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Safety Procedures for Emergency Responders when High Tension Wire Rope Systems are Involved with Run-Off Road Accidents
Dean Alberson, Texas A&M Transportation Institute (Retired), College Station, Texas

Session 4B, *Redwood*

Roadway and Roadside Safety Involving Unique Hazards and Needs
Moderator: Roger Bligh, Texas A&M Transportation Institute, College Station, Texas

Design and Analysis of High Energy Absorbing Rock Fence
Iraj Mamaghani, University of North Dakota, Grand Forks, North Dakota

Design of Reinforced Expanded Polystyrene Styrofoam Covering Rock-Sheds Under Impact of Falling Rock
Iraj Mamaghani, University of North Dakota, Grand Forks, North Dakota

Driving Speeds and Speed Tables: Slovenian Research
Marko Rencelj, University of Maribor, Faculty of Civil Engineering, Transportation Engineering and Architec-ture, Maribor, Slovenia

Development of Crash Modification Functions For The Safety Performance of Treatments on Rural Two-Lane Roads
Jiguang Zhao, CH2M HILL, Chicago, Illinois

Session 4C, *Oregon/Nevada*

Occupant Behavior and Injuries in Crash Events
Moderator: Michael Elle, Minnesota Department of Transportation, Saint Paul, Minnesota

Feasibility of Predicting Light Vehicle Occupant Injury Disutility from Impacts with Road Safety Barriers
Andrew Burbridge, Department of Transport and Main Roads, Queensland University of Technology, Queensland, Australia

Comparison of Human Occupant Kinematics in Laboratory Impact and Run-Off-Road Crash Configurations
Rudolf Reichert, George Mason University, Center for Collision Safety and Analysis, Fairfax, Virginia

Investigation of Potential Mitigation of Driver Injury in Heavy Truck Frontal and Rollover Crashes
Nathan Schulz, Texas A&M Transportation Institute, College Park Station, Texas

Experience with Inclusion of Instrumented Anthropomorphic Test Devices in Roadside Safety Barrier Testing with Heavy Trucks
Chiara Silvestri Dobrovolny (Kovar), Texas A&M Transportation Institute, College Park Station, Texas

Noon - 1:30 p.m., Gold Rush Ballroom
Lunch

1:30 p.m. - 3:15 p.m.
Technical Sessions

Session 5A, *Emerald Ballroom*

Safety of W-Beam Guardrail Systems for Standard and Special Applications
Moderator: Marco Anghileri, Politecnico di Milano, Milan, Italy

Ponderosa Pine Round Posts as Alternative to Rectangular SYP Posts in Retrofit G4(2W) Guardrail Systems
Karla Lechtenberg, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Modeling & Simulation of Vehicle Crashes on Curved, Banked Roadway Sections
Dhafer Marzougui, Center for Collision Safety and Analysis, George Mason University, Fairfax, Virginia

A Synthesis of MASH-Tested 31-in. Tall, Non-Proprietary, W-beam Guardrail Systems
Scott Rosenbaugh, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Evaluation of a 31-inch W-Beam Guardrail for Placement on a 3H:1V Sloped Terrain through FEA
Nathan Schulz, Texas A&M Transportation Institute, College Park Station, Texas

Session 5B, *Redwood*

Investigation and Evaluation of Roadway Departure Crashes and Characteristics

Moderator: John Donahue, Washington State Department of Transportation, Olympia, Washington

Combating Roadway Departures
Richard Albin, Federal Highway Administration, Olympia, Washington

An Analytical Framework of Systematic Screening of Roadway Departure Crashes on Rural Highways in Montana
Md Shafiul Azam, AgileAssets Inc., Austin, Texas

Evaluation of Roadway Departure Characteristics using SHRP 2 Naturalistic Driving Study and Road Information Database Data – Preliminary Results
Shauna Hallmark, Institute for Transportation at Iowa State University, Ames, Iowa

An Exploratory Analysis on Fatalities of Roadway Departure Crashes
Mouyid Islam, CH2M HILL, Chicago, Illinois

Session 5C, *Oregon/Nevada*

Roadside Safety Policies, Strategies, and Guidelines

Moderator: Francesca La Torre, University of Florence, Florence, Italy

Consideration of Roadside Features in the Highway Safety Manual
Christine Carrigan, RoadSafe LLC, Canton, Maine

Selection and Placement Guidelines for Test Level 2 through Test Level 5 Median Barriers
Christine Carrigan, RoadSafe LLC, Canton, Maine

A New Method To Evaluate Roadside Safety For Rural Two-Lane Roads Based On Reliability Analysis
Mohammad Jalayer, Center for Advanced Infrastructure and Transportation, Rutgers University, New Jersey, Piscataway, New Jersey

***Star Ratings And Safer Roads Investment Plan For Cambodia**
Kong Sovann, Road Safety Consultant , Phnom Penh, Cambodia (*Invited Presentation)

Session 5D, *California/Washington*

Roadside Safety Barrier Accreditation, Equipment Evaluation, and Technologies for Maintenance and Work-Zone Operations

Moderator: Michael Dreznes, International Road Federation, Chicago, Illinois

Establishing a National Accreditation Scheme for Road Safety Barrier Industry
Evan Coulson, Road Authority – VicRoads, Melbourne, Australia

Progress Towards A National Harmonisation for Road Side Safety Barrier Training And Accreditations Schemes For Installation And Maintenance In Australia And New Zealand
Paul Hansen, Working Party for National Training and Accreditation in the Roadside Safety Barrier Industry in Australia and New Zealand, Sydney, Australia

Evaluation of Radar Speed Sign for Mobile Maintenance Operations
Ali Jafarnejad, School of Civil and Construction Engineering, Oregon State University, Corvallis, Oregon

***Role of Technology and Autonomous Vehicles in Work Zones**
Fred Bergstresser, Royal Truck & Equipment, Inc., Coopersburg, PA (*Invited Presentation)

3:15 p.m. - 3:45 p.m., Gold Rush Ballroom
Break

3:45 p.m. - 5:30 p.m.
Technical Sessions

Session 6A, *Redwood*
High-Friction Surface Treatments (HFSTS) and Maintenance Practices
Moderator: Ken Kochevar, Federal Highway Administration, California Division, Sacramento, California

Advances in Winter Maintenance Practices to Improve Roadside Safety
Dave Bergner, Monte Vista Associates, LLC, Phoenix, Arizona

High Friction Surfacing Treatment: How a 45 Year Old Process has been Reengineered into the Leading National Safety System used by Highway Agencies to Reduce Fatalities and Serious Injuries
Richard Baker, DBI Services, LLC, Hazleton, Pennsylvania

Improving Pavement Friction to Advance Roadway Safety on Horizontal Curves
Joseph Cheung, FHWA- Office of Safety, Washington, District of Columbia

Safety Impact of High Friction Surface Treatment Installations in the state of Pennsylvania
Seri Park, Villanova University, Villanova, Pennsylvania

Session 6B, *Oregon/Nevada*
Real-World Crash Data
Moderator: Malcolm Ray, Roadsafe LLC, Canton, Maine

Integrating Crash Severity in Roadside Safety Quantitative Analysis: Assessing Partial Proportional Odds Models
Carlos Roque, Laboratório Nacional de Engenharia Civil, Departamento de Transportes, Lisbon, Portugal

Estimate of Occupant Ejection and Occupant Head-Slap Prevalence In Real-World Longitudinal Barrier Crashes
Douglas Gabauer, Bucknell University, Lewisburg, Pennsylvania

Comprehensive Analysis of Bridge-Related Crashes in New Jersey
Mohammad Jalayer, Center for Advanced Infrastructure and Transportation, Rutgers University, Piscataway, New Jersey

Comprehensive Analysis of Run-off-road Crashes in New Jersey
Mohammad Jalayer, Center for Advanced Infrastructure and Transportation (CAIT), Rutgers, The State University of New Jersey

Session 6C, *Emerald Ballroom*
Barrier Evaluation with FEA and Crash Testing Needs for High-Speed Roadways
Moderator: Michael Elle, Minnesota Department of Transportation, Saint Paul, Minnesota

Comparison of Verification and Validation of Crash Test & Simulation Results for Common Barriers
Dhafer Marzougui, Center for Collision Safety and Analysis, George Mason University, Fairfax, Virginia

Applying Finite Element Analysis to Assess the Crash Performance of Modified R350 TL4 Bridge Rail Design in Accordance with the Federal-Aid Reimbursement Eligibility Process
Chuck Plaxico, Roadsafe LLC, Canton, Maine

Evaluating the Relevancy of Current Crash Test Guidelines for Roadside Safety Barriers on High Speed Roads
Chiara Silvestri Dobrovolny, Texas A&M University -Department of Civil Engineering, College Station, Texas

Design Impact Conditions for Testing and Evaluation of Longitudinal Safety Barriers for Use on High Speed Roadways
Roger Bligh, Texas A&M Transportation Institute, College Station, Texas

6:30 p.m. - 8:30 p.m.
Technical Tour (organized by Golden Gate Bridge, Highway and Transportation District – space is limited)

Wednesday, June 14

8:00 a.m. - 4:00 p.m., Emerald Foyer
Registration

8:30 a.m. - 9:30 a.m., Emerald Ballroom
General Session 3
*Moderator: **Ronald Faller**, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska*

Keynote Address: Automotive Safety - Past, Present and Future

- **Priya Prasad**, Ford Motor Company (Retired), Dearborn, MI
  Global Automotive Safety, Autonomous Automobiles, and the Future of the Industry

Paper Awards
Stephen Maher, Transportation Research Board

9:30 a.m. - 3:45 p.m., Gold Rush Ballroom
Exhibits

10:00 a.m. - 11:45 a.m.
Technical Sessions

Session 7A, *Emerald Ballroom*
High Performance, Innovative, and Aesthetic Barriers
Moderator: Michael Dreznes, International Road Federation, Chicago, Illinois

Compliance Crash Testing of the CA ST-70 Side Mounted Bridge Rail
Vue Her, California Department of Transportation, Sacramento, California

Development of MASH TL-5 Steel Median Safety Barrier
Richard Clausius, ArcelorMittal Global R&D, East Chicago, Indiana

Development of a MASH TL-4 Roller Barrier
Frederick Mauer, Gregory Industries, Canton, Ohio

Implementing MASH High-Tension, Three-Cable Guide Rail (HT3CGR) System in Ontario
Mark Ayton, Ontario Ministry of Transportation, Ontario, Canada

Session 7B, *Redwood*
New Vehicle Safety Technologies and Heavy Vehicle Considerations
Moderator: John Donahue, Washington State Department of Transportation, Olympia, Washington

Roadside Safety Implications of Future Vehicle Designs
Dhafer Marzougui, Center for Collision Safety and Analysis, George Mason University, Fairfax, Virginia

Heavy Vehicle Encroachment Trajectories
Malcolm Ray, RoadSafe LLC, Canton, Maine

Commercial Motor Vehicle Safety Measures
John Durkos, Road Systems, Inc., Cleveland, Ohio

Intelligent Transportation System Technology Application for Notification of Vehicles with Right-of Way
Chiara Silvestri Dobrovolny, Texas A&M Transportation Institute, College Station, Texas

Session 7C, *Oregon/Nevada*

Real-World Crash Data - Uses and Benefits
Moderator: Lance Bullard, Texas A&M Transportation Institute, College Station, Texas

Roadside Barrier Issues: Lessons Learned from National Transportation Safety Board (NTSB) Accident Investigations
Donald Karol, National Transportation Safety Board, Waashington, District of Columbia

The Use of Corporate Crash Data to Assist Companies Improve Road Infrastructure for Workplace Safety
Jeffrey Simmons, Transport and Road Safety (TARS) Research Centre, University of New South Wales, Australia

Comparing Objective and Subjective Roadway Data Collection Methods Using Cost-Benefit Analysis for the Proposed Safety Countermeasures
Niloo Parvin, Iowa State University, Ames, Iowa

Noon - 1:30 p.m., Gold Rush Ballroom
Lunch

1:30 p.m. - 3:15 p.m.
Technical Sessions

Session 8A, *Emerald Ballroom*

Innovations and Ongoing Research on Crash Cushions and Guardrail End Terminals
Moderator: John Donahue, Washington State Department of Transportation, Olympia, Washington

New Methodology for Analysis of Sand Barrel Arrays
Robert Bielenberg, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Evaluation of Energy-Absorbing End Terminals Adjacent to Curbs
Jennifer Schmidt, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

A MASH TL-3 Compliant Short Radius System
Akram Abu-Odeh, Texas A&M Transportation Institute, College Station, Texas

Development of a New MASH Guardrail Terminal
John Durkos, Road Systems, Inc., Cleveland, Ohio

Session 8B, *Redwood*

Post-Soil Performance for Guardrail Applications
Moderator: Richard Albin, Federal Highway Administration, Olympia, Washington

Performance Characteristics of Posts Embedded in Soil for Use in Computer Simulation
Karla Lechtenberg, Midwest Roadside Safety Facility, University of Nebraska-Lincoln

Impact Resistance of Guardrail Posts on Sloped Ground
Chung Song, University of Nebraska Lincoln – Lincoln, Nebraska

Behavior and Performance of Wood and Composite Block-outs Raised on Posts during Component Pendulum Impact Testing
Chiara Silvestri Dobrovolny (Kovar), Texas A&M Transportation Institute, College Station, Texas

Evaluation Of Soil Conditions And Post Embedment Depth On Guardrail Post Performance
Ali Atahan, Istanbul Technical University, Istanbul, Turkey

Session 8C, *Oregon/Nevada*
International PerspectivesiIn Roadside Safety Research
Moderator: Ronald Faller, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Worksite Safety Screens (Anti-Gawk/Anti-Debris)
Evan Coulson, Road Agency (VicRoads), Melbourne, Australia

Study of An Innovative Type of Junction for Elements of Road Safety Barriers
Sergio Marco Bassi, Politecnico di Milano - Transport Safety Lab – LaST, Milan, Italy

Development of the Australian and New Zealand Standard for Safety Barriers and Associated Devices
Rod Troutbeck, Troutbeck & Associates, Queensland, Australia

Monitoring and Predicting Traffic Safety in Slovenia
Peter Lipar, University of Ljubljana, Faculty of Civil and Geodetic Engineering, Ljubljana, Slovenia

3:15 p.m. - 3:45 p.m., Gold Rush Ballroom
Break

3:45 p.m. - 5:30 p.m.
Technical Sessions

Session 9A, *Emerald Ballroom*
New Technologies and Guidelines for Concrete Barriers
Moderator: Michael Elle, Minnesota Department of Transportation, Saint Paul, Minnesota

Length of Need for Free-Standing, F-Shape, Portable Concrete Barrier
Robert Bielenberg, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

A MASH Compliant Sign Mounting Designs for Placement on Concrete Median Barrier
Akram Abu-Odeh, Texas A&M Transportation Institute, College Station, Texas

Evaluation of a MASH Test Level 4 Sound Wall Barrier Using Simulation
Nauman Sheikh, Texas A&M Transportation Institute, College Station, Texas

Development of a Precast Slim Temporary Concrete Safety Barrier STCSB 50 for Work Zone Applications
Ali Atahan, Istanbul Technical University, Istanbul, Turkey

Session 9B, *Redwood*
Hazard Identification, Risk Assessment, and Treatment Guidelines
Moderator: Francesca La Torre, University of Florence, Florence, Italy

Identifying Roadway Risk Factors in Pennsylvania's Delaware Valley Region
Seri Park, Villanova University, Villanova, Pennsylvania

Guidelines for Shielding Bridge Piers
Malcolm Ray, RoadSafe LLC, Canton, Maine

Handling an Instant Hazard
Eric Hemphill, North Texas Tollway Authority, Plano, Texas

Benchmarking the Risks of Roadside Hazards
Christine Carrigan, RoadSafe LLC, Canton, Maine

Session 9C, *Oregon/Nevada*

Occupant Risk Assessment - Crash Data, Modeling, and Testing

Moderator: Jennifer Schmidt, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Nebraska

Flail-Space Model – A Review of the Lateral Impact Velocity for Thoracic Injuries
Tana Tan, Transport and Road Safety (TARS) Research – UNSW, Sydney, Australia

Evaluation of Head and Brain Injury Using Empirical and Analytical Predictors in Human Body Model
Davide Benetton, Politecnico di Milano - Transport Safety Lab – LaST, Milan, Italy

Integrated Interior & Restraint Modeling for Occupant Risk Analysis
Rudolf Reichert, Center for Collision Safety and Analysis, George Mason University, Fairfax, Virginia

Comparison of Hybrid III and Human Body Model in Head Injury Encountered in Pendulum Impact and Inverted Drop Tests
Benedetta Arosio, Politecnico di Milano - Transport Safety Lab – LaST, Milan, Italy

6:30 p.m. - 9:30 p.m., Crystal
Roadside Safety Design International Research Activities Subcommittee AFB20(2)

Thursday, June 15

8:00 a.m. - Noon, Emerald Foyer
Registration

8:30 a.m. - 5:00 p.m., Crystal
TRB AFB20 Committing Meeting

8:30 a.m. - Noon
Welcome and Introductions
IRSC Debrief and Feedback
Session I: Motorcycle Safety
Breakout Sessions I
- Motorcycle Safety
- 2nd International Roadside Safety Conference

10:00 a.m. - 10:30 a.m., Emerald Foyer
Break

Noon - 1:30 p.m., Emerald
Lunch

1:00 p.m. - 5:00 p.m., Crystal
Session II: MASH Implementation Updates
Breakout Sessions II
Research Needs
- MASH Implementation Needs and Issues

Breakout Session Summaries
Other Business
Adjourn

3:30 p.m. - 4:00 p.m., Emerald Foyer
Break

CONFERENCE PLANNING TEAM

Ronald Faller, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, Chair
Roger Bligh, Texas A&M Transportation Institute, Co-Chair
Richard Albin, Federal Highway Administration
Marco Anghileri, Politecnico di Milano, Italy
Keith Cota, New Hampshire Department of Transportation
John Donahue, Washington Department of Transportation (Pooled Fund Sponsor)
Mike Dreznes, International Road Federation
Michael Elle, Minnesota Department of Transportation (Pooled Fund Sponsor)
Don Fisher, Ohio Department of Transportation (Pooled Fund Sponsor)
Hampton Clay Gabler, Virginia Tech University
Douglas Gabauer, Bucknell University
Jodi Gibson, Nebraska Department of Roads (Pooled Fund Sponsor and Project Lead)
Raphael Grzebieta, University of New South Wales, Australia
Donna Hardy, West Virginia Department of Highways (Pooled Fund Sponsor)
Joseph G. Jones, Leidos, Inc.
Malcolm Ray, Roadsafe LLC
Jason Siwula, Kentucky Transportation Cabinet (Pooled Fund Sponsor)
Phil TenHulzen, Nebraska Department of Roads (Pooled Fund Sponsor)
Francesca La Torre, University of Florence, Italy
Rod Troutbeck, Troutbeck & Associates, Australia

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