STAPP CAR CRASH CONFERENCE®

Hyatt Regency Washington on Capitol Hill
Washington, D.C.

November 7-9, 2016

Welcome

The Stapp Car Crash Conference is the premier forum for the presentation of research in impact biomechanics, human injury tolerance, and related fields that advance the knowledge of land-vehicle crash injury protection. The conference provides an opportunity to participate in open discussion regarding the causes and mechanisms of injury, experimental methods and tools for use in impact biomechanics research, and the development of new concepts for reducing injuries and fatalities in automobile crashes.

The keynote address for this year's conference will be delivered by Dr. Mark R. Rosekind, Administrator of the National Highway Traffic Safety Administration. Papers that will be presented at this year's Stapp Conference cover a range of timely and important topics in impact biomechanics and occupant protection. These topics include biomechanics of the thorax and abdomen, response and injury in lateral and oblique impact loading, real-world factors related to pedestrian and cyclists injuries, simulated underbody blast testing and morphomics of the ankle/foot, prediction of head/brain injury, and anthropomorphic test devices and computational models. In addition, a special session on Neck Injury and Injury Criteria will be held on Tuesday afternoon.

We would like to thank all of the authors as well as members of the Stapp Advisory Committee for the significant efforts that have been put forth in preparing and reviewing these papers. We encourage all attendees to use the time provided following each paper presentation to offer comments and questions to the presenters. This is a valuable opportunity for further clarification of the research from which all in attendance will benefit. It is hoped that the material presented at this year's conference will provide ideas and motivation for further research that will lead to improvements in occupant protection systems. We also encourage those who are active in impact biomechanics research to submit abstracts for papers to be included in next year's Stapp Conference, which will be held on November 13-15 at the Mills House Wyndham Hotel in Charleston, South Carolina.

On behalf of the Stapp Car Crash Conference Advisory Committee, we invite you to participate in what promises to be a stimulating and enjoyable 60th Stapp Conference at the Hyatt Regency Washington on Capitol Hill.

Eric G. Takhounts, General Chair
National Highway Traffic Safety Administration

Leda L. Ricci, Executive Director
University of Michigan
Transportation Research Institute

Dr. John Paul Stapp, In Memoriam, 1910-1999

A bronze bust of Dr. John Paul Stapp Col USAF MC is displayed each year at the Stapp Car Crash Conference. It was created by artist Walter Rawley of Ruidoso, New Mexico, and donated by Dr. Stapp. The bust depicts Colonel Stapp when he rode the rocket sled at Holloman Air Force Base, subjecting himself to injury-producing accelerations in order to study human tolerance to high-g environments. In his final sled ride in 1954, Dr. Stapp was accelerated to 632 miles per hour in five seconds, and was then decelerated to a stop in 1.4 seconds, experiencing a peak sled deceleration in excess of 40 gs.

Visit our website at http://www.stapp.org/

Stapp Advisory Committee

John P. Stapp, 1955-1999 Permanent Chairman
Colonel USAF MC

Eric G. Takhounts, 2016 General Chair
National Highway Traffic Safety Administration

Leda L. Ricci, Executive Director
University of Michigan
Transportation Research Institute

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John M. Cavanaugh	Wayne State University
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Rolf H. Eppinger	National Highway Traffic Safety Administration, ret.
Warren N. Hardy	Virginia Tech Center for Injury Biomechanics
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Albert I. King	Wayne State University
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Harold J. Mertz	General Motors Corporation, ret.
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Beth A. Winkelstein	University of Pennsylvania
Jac S.H.M. Wismans	SAFETEQ; Chalmers University of Technology
King H. Yang	Wayne State University

Conference Registration

Conference Registration Information

Registration will be available on-line through November 9, 2016.

- Payments may be made by major credit card or check. Electronic funds transfers are not accepted.
- Conference badges will be available at the registration desk.
- Registration for the conference includes one copy of the *Stapp Journal* on a USB flash drive, technical session attendance, continental breakfasts, refreshment breaks, and evening receptions. Student registrations do not include the *Stapp Journal*.

ON-SITE REGISTRATION — Regency Foyer

Sunday, November 6	3:30 PM – 6:00 PM
Monday, November 7	7:30 AM – 4:00 PM
Tuesday, November 8	8:00 AM – 4:00 PM
Wednesday, November 9	8:00 AM –10:00 AM

Stapp Car Crash Journal Pickup

Pre-registered attendees, as well as those registering on-site, may pick up their *Stapp Car Crash Journal* on a USB flash drive along with a conference badge in the **Regency Foyer.**

The *Stapp Car Crash Journal* is a publication of The Stapp Association and is available through SAE International (www.sae.org).
Additional electronic copies of the 2016 *Stapp Journal* on USB flash drives can be purchased for $55 at the Stapp Conference. Please contact SAE Customer Sales and Support for information on how to purchase *Stapp Journals*, Stapp papers, electronic copies of *Stapp Journals*, **or the new Stapp subscription service.** You can reach SAE Customer Sales and Support by phone at 877-606-7323 (U.S. and Canada only) or 724-776-4970 (outside U.S. and Canada), by email at CustomerService@sae.org, or by fax at 724-776-0790.
Papers contained in the *Stapp Car Crash Journal* are indexed/abstracted in MEDLINE, ProQuest, TRIS, and the SAE Global Mobility Database. For copies of individual Stapp papers, contact SAE Customer Sales and Support at the phone number and email address indicated above.

For Stapp Conference information, call Zonda Ketola at (734) 936-1114 or E-mail: stappccc@gmail.com

Hotel Information

Hotel Information

Location — 400 New Jersey Avenue NW

The **Hyatt Regency Washington on Capitol Hill**, the host hotel for the Stapp Conference, is located in the heart of Capitol Hill and is two blocks from Amtrak's Union Station / Metro Subway. It is within walking distance to the U.S. Capitol, National Mall, National Gallery of Art, Washington Monument, National Gallery of Art, U.S. Botanical Gardens, U.S. Supreme Court, and 17 Smithsonian Museums. It is 10 minutes from Ronald Reagan Washington National Airport and 45 minutes from Washington-Dulles and Baltimore Washington International Airports.

Accommodations

Reservations at the **Hyatt Regency Washington on Capitol Hill** may be made by calling the hotel directly at (202) 737-1234 or register on-line from the Stapp website—stapp.org. The room rate for the Stapp Conference is $199 single/double if you register by October 14th. A limited number of rooms are available at a government rate. Be sure to identify yourself as attending the Stapp Car Crash Conference.

Please make your reservations as soon as possible to be assured of a room at the Stapp hotel. Reservations must be guaranteed by credit card or one-night's deposit. Reservations must be cancelled 48 hours prior to date of arrival before 3:00 p.m. EST to have your deposit refunded. **Reservations requested after October 14th are subject to availability and may not be at the conference rate.**

Hotel Parking

Valet parking is offered at $56 per day; hourly parking is also available. Self parking is not available in a hotel lot, and street parking is difficult to find.

Hotel Amenities

The **Hyatt Regency Washington on Capitol Hill** offers many guest facilities, including a fully-equipped StayFit Gym, heated pool and sauna, with massage available by appointment, FedEx, business service center, and gift shop. Each room is equipped with complimentary wireless internet access, private voice mail, cable TV with HBO, coffee maker, hair dryer, iron and ironing board.

Hotel Dining

Article One Lounge is located in the atrium lobby and offers a selection of appetizers, sandwiches and specialty cocktails. **Article One – American Grill** is located in the 5th story atrium and is open for breakfast, lunch and dinner. A full breakfast menu is offered in addition to daily breakfast buffet. For lunch, soup, salads, sandwiches , and entrée selections are available.

Travel Information

Travel Information

Ground Transportation

The nation's capital is one of the easiest cities to navigate and is accessible by three major airports that service the area: Ronald Reagan Washington National Airport, Washington Dulles International Airport, and Baltimore Washington International Thurgood Marshall Airport. The type of transportation available, approximate travel times, and approximate fares to and from each airport are listed below. Please note all fares are subject to change.

From/To Ronald Reagan National Airport (DCA)

Time/Distance: Approximate 15 minute drive or 4.6 miles to downtown Washington DC.
Taxi: Taxis to the hotel near the Washington DC metro are available outside the baggage claim area. Fare is approximately $14 - $18 (10-20 min).
Metro Washington, DC Subway: Take the Yellow line from the airport to the Gallery Place/Chinatown stop. Transfer to the Red line to Union Station (2nd stop). The Union Station Metro stop is located three blocks from the hotel. Fare is approximately $2.70 (20-25 min). Fares may vary based on time of day. To check fares, visit the WMATA website-wmata.com.
Super Shuttle: Available 7 days a week. Shuttle vans are located at the airport, outside the baggage claim area at Ground Transportation. Look for blue vans with yellow lettering. The shuttles make multiple stops and drop off directly at the hotel. Advance reservations may be made by calling 800-BlueVan (800-258-3826) or on Super Shuttle's website-supershuttle.com. Approximate fare is $14 one-way. Timing is dependant upon number of stops required by passengers.

From/To Dulles International Airport (IAD)

Time/Distance: Approximate 45 minute drive or 27.6 miles to downtown Washington DC.
Taxi: Taxis are available on the lower level outside baggage claim. Fare is approximately $60-$80 (50-60 min).
Super Shuttle: Approximate fare is $26 one-way ($10 for additional passengers in same party).

From/To Baltimore/Washington Airport (BWI)

Time/Distance: Approximate 50 minute drive or 31.7 miles to downtown Washington DC.
Taxi: Taxis are available on the lower level outside baggage claim. Fare is approximately $63 (1 hour).
MARC TRAIN Washington, DC: This is a commuter train from BWI to Union Station, which is 3 blocks from the hotel. Approximate cost is $7 one way. The MARC train runs weekdays only.
Super Shuttle: Approximate fare is $37 one-way ($12 for additional passengers in same party).

From/To Union Station/Amtrak Washington, DC

Walking: Hotel is located near Union Station, just 3 blocks away. Follow exit signs to get to the front of Union Station Washington, DC. Take E Street (between the semi-circle of flags) to the intersection of E Street, NW and New Jersey Avenue, NW. The hotel will be directly in front of you.
Taxis: Taxis are available outside the main entrance of Union Station. Approximate fare is $5.50, with possible surcharges.

Dinner provides an upscale grill menu featuring steak, chicken and fresh seafood. **Twenty-four hour room service** is also available.

Dining in the District

There are a number of outstanding restaurants in close proximity to the **Hyatt Regency on Capitol Hill**. Location and phone numbers for these restaurants and other area restaurants will be available at the Conference Registration Desk.

Washington D.C. Attractions

The Washington, D.C. area has numerous attractions within walking distance of the Hyatt Regency on Capitol Hill, and many of them are free of charge. Maps will be available at the Conference Registration Desk.

Washington D.C. Weather

During November, the average temperature is 50-60 degrees Fahrenheit (about 10-16 degrees Celsius). For an up-to-date 10-day weather forecast for Washington, DC, for the meeting week, visitweather.com before your departure.

Please note that meeting rooms in the hotel may be chilly and the temperature is often difficult to adjust. It is recommended that you bring a light sweater or jacket to ensure your comfort.

Conference Information

Speaker Lounge — Columbia Foyer

The speaker lounge is available to all authors and co-authors of conference papers.

Stapp Conference Technical Sessions — Regency A Ballroom

- Please check the session schedule in this final program for starting times.
- Audio or video recording of presentations or discussions, and taking of photographs during the technical sessions, is not permitted.
- In consideration of the speakers and conference attendees, please turn off all cell phones when entering the meeting room.

Conference Sponsors

Conference Sponsors

Fiat Chrysler Automobiles US LLC

Ford Motor Company Fund's Driving Skills for Life Program

Insurance Institute for Highway Safety

The Ohio State University - Injury Biomechanics Research Center

Toyota Motor Corporation

Virginia Tech - Center for Injury Biomechanics

Hosted Receptions

HOSTED RECEPTIONS

On Monday evening, **The Alliance of Automobile Manufacturers** will host a reception in the **Regency B and C Ballrooms** immediately following the afternoon technical session.

On Tuesday evening, **Diversified Technical Systems Inc. (DTS)** will host a reception in the **Regency B and C Ballrooms** immediately following the afternoon technical session.

Preceding the Stapp Conference

PRECEDING THE STAPP CONFERENCE

Sunday, November 6— 9:00 AM–4:40 PM — Regency C and D Ballrooms
Registration opens at 7:30 AM
44th Annual International Workshop in Human Subjects for Biomechanical Research
Sponsored by the National Transportation Biomechanics Research Center, National Highway Traffic Safety Administration

Rodney Rudd, Chair
National Highway Traffic Safety Administration

The purpose of the workshop is to provide a forum for the exchange of ideas and the presentation of current research investigations using human volunteers or surrogates. No registration fee is required. For additional information, contact:

Rodney Rudd, Ph.D.
NHTSA/Human Injury Research Division, NVS-323
400 Seventh Street, S.W.
Washington, D.C. 20590

Phone: (202) 366-5932
Fax: (202) 366-8546
E-mail: Rodney.Rudd@NHTSA.gov

Monday, November 7

Technical Program

In the Regency A Ballroom

Audio and videotaping will not be permitted.
Please turn off cell phones in the meeting room.

9:00 **WELCOME AND OPENING REMARKS** – General Chair, Erik G. Takhounts, National Highway Traffic Safety Administration

9:15 **KEYNOTE ADDRESS — The Road to Zero: NHTSA'S Three Lanes**
Mark R. Rosekind, Administrator, National Highway Traffic Safety Administration

BIOMECHANICS OF THE THORAX AND ABDOMEN

Co-Chairs: Philippe Beillas, Univ. Lyon 1 - IFSTTAR
Warren N. Hardy, Virginia Tech Center for Injury Biomechanics

9:45 **Age-Specific Injury Risk Curves for Distributed, Anterior Thoracic Loading of Various Sizes of Adults Based on Sternal Deflections**
Harold J. Mertz, General Motors Corporation (retired); Priya Prasad, Prasad Engineering, LLC; Dainius J. Dalmotas, D. J. Dalmotas Consulting, Inc.; Annette L. Irwin, General Motors LLC

10:15 **The Effect of Rib Shape on Stiffness**
Sven A. Holcombe, Stewart C. Wang, and James B. Grotberg, University of Michigan

10:45 – 11:15 **REFRESHMENT BREAK**

11:15 **Effect of Abdominal Loading Location on Liver Motion: Experimental Assessment using Ultrafast Ultrasound Imaging and Simulation with a Human Body Model**
Anicet Le Ruyet, Univ. Lyon 1 – IFSTTAR; Fabien Berthet, Transpolis SAS; Frédéric Rongiéras, Univ. Lyon 1- IFSTTAR - Hôpital Desgenettes; Philippe Beillas, Univ. Lyon 1 - IFSTTAR

11:45 **Biomechanical Responses of PMHS Subjected to Abdominal Seatbelt Loading**
Rakshit Ramachandra, Yun-Seok Kang and John H. Bolte IV, The Ohio State University; Alena Hagedorn and Rodney Herriott, Transportation Research Center Inc.; Jason A. Stammen and Kevin Moorhouse, National Highway Traffic Safety Administration

12:15 – 2:15 **LUNCH**

RESPONSE AND INJURY IN LATERAL AND OBLIQUE IMPACT LOADING

Co-Chairs: Saeed Barbat, Ford Motor Company
Farid Bendjellal, Britax Childcare Ltd.

2:15 **Investigation of Pelvic Injuries on Eighteen Post Mortem Human Subjects Submitted to Oblique Lateral Impacts**
Matthieu Lebarbé, Pascal Baudrit, Pascal Potier, CEESAR (Nanterre – France); Philippe Petit and Xavier Trosseille, LAB PSA Peugeot Citroën Renault (Nanterre – France); Sabine Compigne, Toyota Motor Europe NV/SA (Belgium); Mitsutoshi Masuda and Takumi Fujii, Toyota Motor Corporation (Japan); Richard Douard, Université René Descartes (Paris – France)

2:45 **Responses and Injuries to PMHS in Side-Facing and Oblique Seats in Horizontal Longitudinal Sled Tests per FAA Emergency Landing Conditions**
John R. Humm, Narayan Yoganandan, Frank A. Pintar, Department of Neurosurgery, Medical College of Wisconsin, Milwaukee, WI; Richard L. DeWeese, David M. Moorcroft, Amanda M. Taylor, Civil Aerospace Medical Institute, Oklahoma City, OK; Brian Peterson, Milwaukee County Medical Examiner's Office, Milwaukee, WI

3:15 – 3:45 **REFRESHMENT BREAK**

REAL-WORLD FACTORS RELATED TO PEDESTRIAN AND CYCLISTS INJURIES

3:45 **Association of Impact Velocity with Risks of Serious Injuries and Fatalities to Pedestrians in Commercial Truck-Pedestrian Accidents**
Yasuhiro Matsui and Shoko Oikawa, National Traffic Safety and Environment Laboratory, Japan; Kazuhiro Sorimachi, Akira Imanishi, and Takeshi Fujimura, Isuzu Advanced Engineering Center, Ltd., Japan

4:15 **Traffic Accidents Involving Cyclists Identifying Causal Factors Using Questionnaire Survey, Traffic Accident Data, and Real-World Observation**
Shoko Oikawa, National Traffic Safety and Environment Laboratory, Japan; Toshiya Hirose, Shibaura Institute of Technology, Japan; Shigeru Aomura, Tokyo Metropolitan University, Japan; Yasuhiro Matsui, National Traffic Safety and Environment Laboratory, Japan

4:45 **ANNOUNCEMENTS**

Audio and videotaping will not be permitted.
Please turn off cell phones in the meeting room.

SIMULATED UNDERBODY BLAST TESTING AND MORPHOMICS OF THE ANKLE/FOOT

Co-Chairs: John Bolte, The Ohio State University
Priya Prasad, Prasad Engineering, LLC

8:30 **Evaluation of WIAMan Technology Demonstrator Biofidelity Relative to Sub-Injurious PMHS Response in Simulated Under-body Blast Events**
Hollie A. Pietsch, Kelly E. Bosch, David R. Weyland, US Army Tank Automotive Research, Development, and Engineering Center; E. Meade Spratley, Kyvory A. Henderson, Robert S. Salzar, University of Virginia Center for Applied Biomechanics; Terrance A. Smith, Brandon M. Sagara, Dynamic Research, Inc.; Constantine K. Demetropoulos, Christopher J. Dooley, Andrew C. Merkle, Johns Hopkins University Applied Physics Laboratory

9:00 **Biomechanical Response of Military Booted and Unbooted Foot-Ankle-Tibia from Vertical Loading**
Frank A. Pintar, Michael B. Schlick, and Narayan Yoganandan, Medical College of Wisconsin and VA Medical Center; Liming M. Voo and Andrew C. Merkle, Johns Hopkins University Applied Physics Laboratory; Michael Kleinberger, US Army Research Laboratory

9:30 **Morphomics of the Talus**
David Gorman, Ebram Handy, General Motors LLC and International Center for Automotive Medicine Fellows; Sikui Wang, Annette L.Irwin, General Motors LLC; Stewart Wang, International Center for Automotive Medicine

10:00 – 10:30 **REFRESHMENT BREAK**

PREDICTION OF HEAD/BRAIN INJURY

10:30 **New Risk Curves for NHTSA's Brain Injury Criterion (BrIC): Derivations and Assessments**
Tony R. Laituri, Scott Henry, Kevin Pline, Guosong Li, Michael Frankstein, and Para Weerappuli, Ford Motor Company

11:00 **Development of an Unbiased Validation Protocol to Assess the Biofidelity of Finite Element Head Models used in Prediction of Traumatic Brain Injury**
Chiara Giordano and Svein Kleiven, Royal Institute of Technology KTH

11:30 – 1:15 **LUNCH**

1:15 **JOHN PAUL STAPP BEST PAPER AWARD** — The John Paul Stapp Award for the best paper of the 2015 conference and journal will be presented by Erik G. Takhounts to Kerry A. Danelson, Wake Forest School of Medicine ; Andrew R. Kemper and Matthew J. Mason, Virginia Tech; Michael Tegtmeyer, US Army Research Laboratory; Sean A. Swiatkowski (USN), Armed Forces Medical Examiner System; John H. Bolte IV, The Ohio State University; Warren N. Hardy, Virginia Tech, for *Comparison of ATD to PMHS Response in the Under-Body Blast Environment.*

INVITATION AND CALL FOR PAPERS
General Chair, Guy S. Nusholtz, Fiat Chrysler Automobiles US LLC
61st Stapp Car Crash Conference, The Mills House Wyndham Hotel, Charleston, SC, November 13-15, 2017

SPECIAL SESSION: NECK INJURY AND INJURY CRITERIA (Oral Only)

Co-Chairs: Erik G. Takhounts, National Highway Traffic Safety Administration
Frank A. Pintar, Medical College of Wisconsin

1:30 **Incidence of Neck Injury Among Belted Adult Occupants of Modern Light-Duty Vehicles,** Dainius J. Dalmotas, D.J. Dalmotas Consulting Inc.

2:00 **Biomechanics of the Pediatric Spine: Injury Mechanisms and Influence on Head Protection,**
Kristy B. Arbogast, The Children's Hospital of Philadelphia (CHOP) and University of Pennsylvania

2:30 **Neck Injury Criteria: Historical Background—Regulation and NCAP,** Priya Prasad, Prasad Engineering, LLC

3:00 **Nij: The Nodding Dilemma,** Guy S. Nusholtz, Fiat Chrysler Automobiles US LLC

3:30 – 4:00 **REFRESHMENT BREAK**

4:00 **Neck Injury Biomechanics: The Relative Importance of Compression, Tension, and Bending**, Roger W. Nightingale, Duke University

4:30 **What is the True Cause of Whiplash Pain?,** Albert I. King, Wayne State University

5:00 **Investigation of Intervertebral Kinematics in Rear Impact and Development of Potential Injury Criteria,** Kevin Moorhouse, NHTSA

5:30 **ANNOUNCEMENTS**

Wednesday, November 9 **Technical Program** In the Regency A Ballroom

Audio and videotaping will not be permitted.
Please turn off cell phones in the meeting room.

ANTHROPOMORPHIC TEST DEVICES AND COMPUTATIONAL MODELS

Co-Chairs: King H. Yang, Wayne State University
Xavier Trosseille, LAB PSA Peugeot Citroën Renault

9:00 **Development, Evaluation, and Sensitivity Analysis of Parametric Finite Element Whole-Body Human Models in Side Impacts**
Eunjoo Hwang, Jingwen Hu, Cong Chen, Katelyn F. Klein, Carl S. Miller, Matthew P. Reed, University of Michigan Transportation Research Institute; Jonathan D. Rupp, Emory School of Medicine; Jason J. Hallman, Collaborative Safety Research Center, Toyota Technical Center, USA

9:30 **Development and Full Body Validation of a 5th Percentile Female Finite Element Model**
Matthew L. Davis, Bharath Koya, Jeremy M. Schap, F. Scott Gayzik, Wake Forest School of Medicine, Virginia Tech-Wake Forest University Center for Injury Biomechanics

10:00 – 10:30 **REFRESHMENT BREAK**

10:30 **Thoracic Injury Risk Curves for Rib Deflections of the SID-IIs Build Level D**
Annette L. Irwin, Greg Crawford, David Gorman, Sikui Wang, General Motors LLC; Harold J. Mertz, General Motors Corporation (retired)

11:00 **The Large Omnidirectional Child (LODC) ATD: Biofidelity Comparison with the Hybrid III 10 Year Old**
Jason Stammen and Kevin Moorhouse, National Highway Traffic Safety Administration; Brian Suntay, Transportation Research Center Inc.; Michael Carlson and Yun-Seok Kang, The Ohio State University

11:30 **JOHN W. MELVIN BEST STUDENT PAPER AWARDS**
Albert I. King

11:45 **ADJOURNMENT**
General Chair, Erik G. Takhounts, National Highway Traffic Safety Administration

STAPP
Call for Papers

61st STAPP CAR CRASH CONFERENCE®

The Mills House Wyndham Hotel
Charleston, South Carolina
November 13-15, 2017

Guy S. Nusholtz, General Chair
Fiat Chrysler Automobiles US LLC

Abstract Submission Deadline – March 17, 2017

The Stapp Conference Advisory Committee invites abstracts of prospective papers for consideration in planning the 61st Stapp Car Crash Conference and Journal. Papers are desired on research in impact/injury biomechanics and related fields, including analyses of real-world crash and injury data and development of injury assessment tools, that advance knowledge pertaining to human injury causation and lead to improved countermeasures for injury and fatality reduction. In addition to research and developments concerned with injuries to motor vehicle occupants and pedestrians, papers on studies dealing with sports-related injuries and injuries in military environments are welcome. Papers are also invited on crash avoidance technologies that offer potential to further enhance occupant crash protection.

Abstracts may be submitted at anytime and, if approved, invited papers will be reviewed throughout the year and presented at the appropriate Conference upon receiving final approval by the reviewers. Early submission of abstracts is strongly encouraged. Prospective authors will be notified within two weeks of receipt of their abstract as to whether their paper is invited for review, thereby allowing authors to submit manuscripts early. Doing so will allow more time for authors to comply with reviewer comments.

Abstracts for paper offers must include the following:

1. a tentative title for the paper
2. author information (name, affiliation, address, phone, fax, and e-mail)
3. a one-page abstract **submitted as a Microsoft Word file (.docx) or PDF file** that clearly
   - defines the problem that the study addresses
   - states the objective of the study
   - outlines the methodology used
   - states explicitly the data to be included in the paper, and
   - summarizes the key results and conclusions of the study

✔ Invitation of a paper for review is based solely on the abstract so it is important that authors provide clear, descriptive, and specific information by which the paper offer can be evaluated.

✔ All papers submitted for review must include new data and results that will not have been submitted or published elsewhere prior to the Conference.

✔ If a paper on a similar topic has recently been published or submitted for publication, the authors must clarify what is new in the proposed paper that warrants publication in Stapp.

✔ For papers reporting on research involving human or animal subjects, a statement that the methods used have been approved by a properly constituted institutional review board (IRB) must be provided with the abstract. Abstract submissions and paper offers that do not provide this information will not be invited for review by the Stapp Advisory Committee.

✔ Papers offered for consideration at the Stapp Conference and in the *Stapp Journal* must be written in an objective, scholarly, and scientific manner, and must be free of commercialism, advertisement, and product identification.

✔ Papers must be prepared in clear English, and all data must be presented using SI units.

✔ Papers that are judged to meet the standards and requirements of the *Stapp Journal* will be accepted for publication and presentation, and must be presented at the Conference.

Summary of Submission Deadlines

Abstract	**March 17, 2017**
Initial Manuscript	**May 31, 2017**
Final Manuscript	**September 22, 2017**

Submit Abstracts to: Leda L. Ricci, Executive Director, Stapp Conference Advisory Committee, University of Michigan Transportation Research Institute, 2901 Baxter Road, Ann Arbor, MI 48109-2150. Authors may also submit abstracts by fax to (734) 647-3330 or by e-mail to leda@umich.edu. If you have questions regarding abstract or paper submission, please call (734) 936-1114.

Technical Paper Awards

The **John Paul Stapp Award** is offered annually for the Stapp paper presented at the previous year's Conference and Journal that best meets the goals of the Stapp Car Crash Conference and *Stapp Journal* as judged by the members of the Stapp Advisory Committee.

The John W. Melvin Student Awards of $1,500, $1,000, and $500 are presented to the three graduate students whose papers are judged by the Stapp Student Award Committee to have made the most significant contributions to the fields of injury biomechanics and injury reduction. Mentors of accepted papers that include significant contributions by a student are invited to describe those contributions in a letter for their student to be considered. The three awards are made at the end of the Conference in which the papers were presented.

Notes

Stapp Car Crash Conference®
UMTRI
2901 Baxter Road
Ann Arbor, MI 48109-2150

Plan to attend the 61st Stapp Car Crash Conference
The Mills House Wyndham Hotel • Charleston, South Carolina • November 13-15, 2017