



Benefits of Interaction Between UTCA and Other Safety-Focused Center and Organizations

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UTCA Theme: Management and Safety of Transportation Systems

Prepared by

UTCA

University Transportation Center for Alabama
The University of Alabama, The University of Alabama at Birmingham, and
The University of Alabama in Huntsville

UTCA Report 99252
November 30, 2000

University Transportation Center for Alabama

About UTCA The University Transportation Center for Alabama (UTCA) is designated as a "university transportation center" by the US Department of Transportation. UTCA serves a unique role as a joint effort of the three campuses of the University of Alabama System. It is headquartered at the University of Alabama (UA) with branch offices at the University of Alabama at Birmingham (UAB) and the University of Alabama in Huntsville (UAH). Interdisciplinary faculty members from the three campuses (individually or operating in teams) perform research, education, and technology transfer projects using funds provided by UTCA and external sponsors. The projects are guided by the UTCA Annual Research Plan. The plan is prepared by the Advisory Board to address transportation issues of great importance to Alabama and the region.

Mission Statement and Strategic Plan The mission of UTCA is "to advance the technology and expertise in the multiple disciplines that comprises transportation through the mechanisms of education, research, and technology transfer while serving as a university-based center of excellence."

The UTCA strategic plan contains six goals that support this mission, as listed below:

- Education – conduct a multidisciplinary program of coursework and experiential learning that reinforces the theme of transportation;
- Human Resources – increase the number of students, faculty and staff who are attracted to and substantively involved in the undergraduate, graduate, and professional programs of UTCA;
- Diversity – develop students, faculty and staff who reflect the growing diversity of the US workforce and are substantively involved in the undergraduate, graduate, and professional programs of UTCA;
- Research Selection – utilize an objective process for selecting and reviewing research that balances the multiple objectives of the program;
- Research Performance – conduct an ongoing program of basic and applied research, the products of which are judged by peers or other experts in the field to advance the body of knowledge in transportation; and
- Technology Transfer – ensure the availability of research results to potential users in a form that can be directly implemented, utilized or otherwise applied.

Theme The UTCA theme is "*MANAGEMENT AND SAFETY OF TRANSPORTATION SYSTEMS.*" The majority of UTCA's total effort each year is in direct support of the theme; however, some projects are conducted in other topic areas, especially when identified as high priority by the Advisory Board. UTCA concentrates upon the highway and mass transit modes, but also conducts projects featuring rail, waterway, air, and other transportation modes as well as intermodal issues.

Disclaimer

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16. Abstract The overall objectives of the project were to investigate the activities and resources of other centers and organizations nationwide that are involved in transportation safety issues relevant to the mission of the University Transportation Center for Alabama (UTCA) and to facilitate relationships and communication paths between UTCA participants and these other organizations. Links and contact information, as well as summaries of the activities of other transportation-safety focused organizations, were summarized on a web page to help facilitate interaction between these organizations and UTCA participants. Also, centers and research programs that specifically focus on transportation-injury research ongoing at the University of Alabama at Birmingham (UAB) were described to help encourage collaboration among researchers of the University of Alabama (UA) system campuses. Educational aspects of the project include the support of several UAB Civil Engineering undergraduate students interested in pursuing graduate studies in transportation safety. A web page entitled "Saving Lives with Shared Information (SLSI)" that links UTCA participants to information about other safety-related organizations was developed by these students and resides at www.eng.uab.edu/cee/SLSI/slsimain.html . Three students who were supported by the project decided to pursue graduate studies in civil engineering. These students gained valuable experience by participating in transportation safety research programs new to UAB, such as the activities of the newly formed <i>Center for Injury Sciences</i> and the Mercedes-Benz <i>Crash Injury Research and Engineering Network</i> (CIREN) center. The students were also instrumental in starting the preliminary work for new transportation safety initiatives. These activities include conducting a literature search on transportation safety subjects in which UAB civil engineering has interest and developing new and unique capabilities such as automobile crash occupant kinematic modeling. The final report contains an overview of the activities and accomplishments of the project, an outline of the SLSI web page, a summary of transportation safety and injury analysis research activities ongoing at UAB, and recommendations for continuing this effort as a service to UTCA.			
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Executive Summary

The overall objectives of the project were to investigate the activities and resources of other centers and organizations nationwide that are involved in transportation safety issues relevant to the mission of the University Transportation Center for Alabama (UTCA) and to facilitate relationships and communication paths between UTCA participants and these other organizations. Links and contact information, as well as summaries of the activities of other transportation-safety focused organizations, were summarized on a web page to help facilitate interaction between these organizations and UTCA participants. Also, centers and research programs that specifically focus on transportation-injury research ongoing at the University of Alabama at Birmingham (UAB) were described to help encourage collaboration among researchers of the University of Alabama (UA) system campuses. Educational aspects of the project include the support of several UAB civil engineering undergraduate students interested in pursuing graduate studies in transportation safety. A web page entitled "Saving Lives with Shared Information (SLSI)" that links UTCA participants to information about other safety-related organizations was developed by these students and resides at www.eng.uab.edu/cee/SLSI/slsimain.html. Three students who were supported by the project decided to pursue graduate studies in civil engineering. These students gained valuable experience by participating in transportation safety research programs new to UAB, such as the activities of the newly formed *Center for Injury Sciences* and the *Mercedes-Benz Crash Injury Research and Engineering Network (CIREN)* center. The students were also instrumental in starting the preliminary work for new transportation-safety initiatives. These activities include conducting a literature search on transportation safety subjects in which UAB civil engineering has interest and developing new and unique capabilities such as automobile crash occupant kinematic modeling. The final report contains an overview of the activities and accomplishments of the project, an outline of the SLSI web page, a summary of transportation safety and injury analysis research activities ongoing at UAB, and recommendations for continuing this effort as a service to UTCA.

1. Introduction and Project Description

Because of its world-class medical school, there are many injury-related research activities ongoing at the University of Alabama at Birmingham (UAB). Furthermore, many of these activities focus on transportation-related injuries. This is emphasized by the recent creation of two new centers at UAB that have a strong focus on automobile crash injuries: the *Center for Injury Sciences* and the *Crash Injury Research and Engineering Network (CIREN)* Center. These two centers initiated activities at practically the same time that the University Transportation Center for Alabama (UTCA) was established.

The Department of Civil and Environmental Engineering at UAB is involved in these injury-related research activities. Dr. Jim Davidson is the Associate Director of the Mercedes-Benz CIREN Center and is also involved in several other collaborative projects with researchers of the Department of Surgery, The School of Public Health, The Childrens' Hospital, and the Department of Biomedical Engineering. Since transportation safety is one of the focus areas of UTCA, this project was initiated to provide some simple resources that might help facilitate collaboration between UTCA investigators and other researchers who are involved in transportation safety research. The overall objectives of the project are shown below:

- Investigate the activities and resources of other centers and organizations nationwide that are involved in safety issues relevant to the UTCA mission, but with focus on those active in Alabama;
- Facilitate relationships and communication paths between UTCA participants and these other organizations;
- Identify specific areas of potential collaborative research;
- Facilitate communication between state and local governments and these other centers and organizations;
- Summarize the results in a form that would be useful to all UTCA participants;
- Involve students who may be interested in graduate studies in a related area.

2. Methodology

To accomplish the objectives of the project, the work was divided into the following tasks.

1. Identify other centers and organizations with missions related to the UTCA mission.
2. Collect information about the activities, resources, contact persons, etc.
3. Contact and possibly visit focus persons of those organizations.
4. Identify specific ways that UTCA can benefit from collaboration.
5. Summarize all of the information into a summary report and web page that would be useful to all UTCA participants.

Several civil engineering undergraduate students who had expressed interest in pursuing a graduate degree in a transportation-safety related area participated in the project. Budget items for the project consisted only of part-time wages for students and a small amount of money for travel to meet with other researchers involved in transportation safety related activities. The primary activity of the students was to conduct web-based searches to identify other centers and organizations whose missions were related to transportation safety research and to summarize this into a web page. Because of the crash injury research activities at UAB, the information collected by the students had an automotive safety focus. Under Dr. Davidson's guidance, the students put together a web page of links to the resources that they had found.

Dr. Davidson also involved these students in the injury research activities, such as CIREN, that are going on at UAB. As part of the CIREN program, these students participated in CIREN team crash review meetings in which specific crash cases were studied. Since the area of automotive safety and crash analysis is new to UAB Civil Engineering, these students investigated literature and other resources pertinent to the effort. These students also explored ways of integrating occupant kinematics computer modeling into the crash investigations and other crash research. In addition to participation by the students funded by UTCA, the opportunity was used to involve summer Research Experiences for Undergraduates (REU) students in these injury research activities. These students and their current activities are described in Appendix A.

As part of this project and other activities, Dr. Davidson met with researchers involved in centers and organizations with transportation safety missions, and integrated the findings into the web page and this report. Part of the interaction with these investigators was to identify what collaboration may be useful to both organizations. A summary of these activities is provided in the *Results* section of this report.

3. Results

3.1 Web Page Development and Student Participation

The results of the project are multifaceted. The web page developed by the students resides at www.eng.uab.edu/cee/SLSI/slsimain.html. The centers and organizations described by the web page are listed in Table 3-1 and the contents of the page are presented in Appendix A. The SLSI web page was created to help facilitate communication and collaboration between UTCA participants and other transportation-focused researchers. Therefore, the web page essentially provides a discussion of this project, a brief description of each center and organization listed, and links to sources of information that will help UTCA participants develop proposals that involve transportation safety and perhaps involve collaboration with other transportation safety centers and organizations.

Table 3-1. Centers and organizations described by the SLSI web page

<i>Advocates for Highway and Auto Safety</i>	<i>Insurance Institute for Highway Safety (IIHS)</i>	<i>Renfroe Engineering, Inc.</i>
<i>Association for the Advancement of Automotive Medicine (AAAM)</i>	<i>Injury Control Resource Information Network (ICRIN)</i>	<i>Ryerson Polytechnic University - Vehicle Safety Research Center</i>
<i>Bureau of Transportation Statistics (BTS)</i>	<i>International Journal of Crashworthiness</i>	<i>Society of Automotive Engineers (SAE)</i>
<i>Bioengineering Center of Wayne State University</i>	<i>Iowa Injury Prevention Research Center (IIPRC)</i>	<i>Strategic Crash Analysis and Response System (SCARS)</i>
<i>Biomechanics World-Wide</i>	<i>Knott Laboratory, Inc.</i>	<i>University of Alabama at Birmingham Center for Injury Sciences</i>
<i>Communications for Coordinated Assistance and Response to Emergencies (ComCARE) Alliance</i>	<i>MADYMO, Division of TNO's Crash Safety Center</i>	<i>University of Alabama at Birmingham Injury Control Research Center (ICRC)</i>
<i>Commercial Vehicle Safety Alliance (CVSA)</i>	<i>Mercedes-Benz CIREN Center at UAB</i>	<i>University of Alabama at Birmingham Center for Aging</i>
<i>Crash Injury Research & Engineering Network (CIREN)</i>	<i>National Highway Traffic Safety Administration (NHTSA)</i>	<i>University of Michigan Transportation Research Institute (UMTRI)</i>
<i>Critical Analysis Reporting Environment (CARE)</i>	<i>National Aging Information Center</i>	<i>University of New York at Buffalo Center for Transportation Injury Research (CenTIR)</i>
<i>U.S. Department of Transportation (DOT)</i>	<i>National Automotive Sampling System (NASS)</i>	<i>University of North Carolina Highway Safety Research Center (HSRC)</i>
<i>Drexel Intelligent Infrastructure and Transportation Safety Institute (DI3)</i>	<i>National Center for Injury Prevention and Control (NCIPC)</i>	<i>University Transportation Center for Alabama (UTCA)</i>
<i>ESI Group</i>	<i>National Crash Analysis Center (NCAC)</i>	<i>University of Virginia Automobile Safety Laboratory (ASL)</i>
<i>Fatality Analysis Reporting System (FARS)</i>	<i>National Library of Medicine PubMed</i>	<i>Veridian Engineering's Automated Collision Notification (ACN) system</i>
<i>Federal Highway Administration (FHWA)</i>	<i>Network of Employers for Traffic Safety</i>	

Another valuable product of the project is the involvement of students who were interested in pursuing graduate education in a transportation safety related area. As described above, three UAB students, Anna Simpson, Dan Connell, and Trey Gauntt, who were involved in the project are now pursuing civil engineering graduate degrees. A description of these students plus their current activities is provided in Appendix A as part of the SLSI web page.

The project was also used as an opportunity to provide an introduction on transportation safety research at UAB to the structural engineering REU students and to integrated aspects of this research into courses such as *Advanced Mechanics* and *Introduction to Finite Elements*.

3.2 Contacts with other Researchers

Researchers of other safety-focused centers and organizations were contacted and, in some cases, visited. This aspect of the project has already proven very valuable in helping to facilitate collaboration between Dr. Davidson and other UAB researchers. The organizations (external to UAB) and primary contact persons visited by Dr. Davidson as part of this effort and in conjunction with other transportation safety research efforts are provided in Table 3-2.

Table 3-2. Organizations visited and contact persons

Organization	Primary Contact	Date Visited
U. of Michigan Program for Injury Research and Education (UMPIRE)	Dr. Stewart Wang, M.D., Ph.D. UMPIRE P.I. and Director Trauma Burn Center	August 31, 1999
The University of Michigan Transportation Research Institute (UMTRI)	Dr. Larry Schneider, Ph.D. Senior Research Scientist Head, Biosciences Division	August 31, 1999
Wayne State Bioengineering Center	Dr. Albert King, Distinguished Professor of Engineering Director, Bioengineering Center Dr. King Yang Associate Professor, Mechanical/Bioengineering	September 1, 1999
NHTSA	Lou Brown and Cathy McCullough, plus other researchers involved in CIREN	August 1-4, 1999, May 4-5, 2000, July 20-21, 2000, November 29-30, 2000
NHTSA/George Washington University	Dr. Feris Bandak	November 28, 2000
Mercedes-Benz	Dr. Dan Selke, Manager Safety Engineering	Multiple dates
Science Serving Society	Dr. Leonard Evans, President	September 21-22, 2000

UA Department of Management and Marketing	Dr. Michele Bunn and Dr. Grant Savage, Co-P.I.s of "Feasibility Of An Integrated Traffic Management and Emergency Communication System For Birmingham, Alabama"	March 10 and November 7, 2000
CenTIR/Veridian	Dr. Alan Blatt, Director of Engineering Research, Dr. Bruce Donnelly, Principal Engineer Transportation Sciences, plus others involved in transportation safety research	November 13, 2000

3.3 Transportation Safety Research Activities of the UAB Department of Civil and Environmental Engineering

The UAB Civil Engineering Department is involved in several collaborative research efforts related to transportation safety. These activities are described here to encourage researchers of other University of Alabama system campuses who are interested in developing collaborative research to take advantage of expertise unique to UAB. Because of the resident medical expertise at UAB, much of this involves automobile crash and injury analysis research. This includes the activities of the Mercedes-Benz *Crash Injury Research and Engineering Network* (CIREN) Center. The activities of this center revolve around (1) collecting an immense amount of data about specific automobile crashes that occur in the region and the injuries that result, (2) analyzing crash events and resulting injuries, (3) entering this information into the central CIREN database, and (4) presenting findings at quarterly CIREN conferences in Washington, D.C. Approximately 50 cases per year are collected and analyzed. The responsibilities of the engineering component of the CIREN team are, in general, to provide engineering technical assistance regarding crash dynamics as well as injury biomechanics. A summary of CIREN activities and objectives from the February 2000 presentation to the ALDOT *Forty-third Annual Transportation Conference* is provided on the SLSI web page.

Another recently established UAB center that is involved in transportation safety research is the *Center for Injury Sciences*. This center is directed by Dr. Loring Rue, M.D., Professor of Surgery and Chief of Trauma, Burns, and Critical Care. The mission of this center is to provide multidisciplinary focus for the care of injured patients and for research related to both prevention and treatment of injuries.

Prior to the establishment of the Mercedes-Benz CIREN Center and the initiation of this project, there was little collaboration between UAB engineering and the schools of Medicine and Public Health focused on transportation safety. However, one exception to this is the work of Dr. Alan Eberhardt in the Department of Biomedical Engineering and Dr. Jorge Alonzo of the Department of Surgery, Section of Orthopedic Surgery. Drs. Eberhardt and Alonzo have been studying fracture mechanisms of human pelvis from loading associated with side-impact automobile collisions. The work involves both laboratory testing and finite element modeling. It was originally sponsored by the Center for Disease Control through the UAB *Injury Control Research Center*, but is now being sponsored by NHTSA through the *Center for Injury Sciences*.

Other collaborative transportation injury projects include: (1) "Development of a Model State Brain Injury Program" with the Department of Surgery; (2) "Study of Craniofacial Injuries in the Pediatric Trauma Population and Mechanical Characterization of Pediatric Hard Tissue Bone Properties" with Dr. John Grant, M.D., of the UAB Children's Hospital and Dr. Evangelos Eleftherio, Ph.D., of the UAB Department of Mechanical Engineering; (3) "Biomechanics of the Pelvic Ring, Acetabular and Ankle Fractures" with Dr. Alan Eberhardt, Ph.D., of the Department of Biomedical Engineering and Dr. Jorge Alonzo, M.D., of the Department of Surgery, Division of Orthopedic Surgery.

One aspect of crash injury analysis that UAB engineering is trying to develop capabilities in is occupant kinematics modeling. Such capabilities would be valuable in a wide range of collaborative research that would require an in-depth understanding of the movement of automobile occupants during crash and the forces and accelerations that occur at impact. The students involved in this project investigated advanced modeling software such as LS-Dyna, Madymo, and Articulated Total Body (ATB), which may be useful in occupant kinematic modeling. To Dr. Davidson's knowledge, this expertise and capability does not exist elsewhere in Alabama. With the influx of automotive industry into Alabama, there may be opportunities to grow research programs involving automobile crash dynamics.

As described in the introduction to the SLSI web page, any UTCA participant interested in learning more about these activities and who may be interested in integrating expertise represented by these activities into future proposals is encouraged to contact Dr. Davidson.

3.4 Potential Areas of Collaboration

The ultimate goal of this project was to provide information that would facilitate collaboration on transportation safety research between faculty members of the University of Alabama system (UTCA), and between UTCA faculty and researchers of other centers and organizations that might be beneficial to UTCA projects. The project has been of great value to UAB civil engineering in developing transportation safety partnerships, and now, the resources are established for other UTCA participants to develop such collaborative efforts.

There could be great advantages for the three UTCA campuses to combine their expertise and pursue large non-UTCA grants. Of course, UTCA funding can be extremely valuable in providing "seed" money to build expertise and partnerships. For example, the activities of the CIREN center and the epidemiology expertise at UAB could be combined with traffic safety or roadside safety expertise at the University of Alabama (UA) and University of Alabama in Huntsville (UAH) campuses to pursue research that first identifies recurring trends in accidents and then provides engineering analysis of potential solutions. Or, the data mining expertise and the CARE database management at UA could be combined with emergency medicine expertise at UAB to identify needs for improving emergency medical transportation to the appropriate trauma care services.

Furthermore, the SLSI web page could link UTCA participants to outside sources of expertise that could be involved to enhance their research proposals.

Based upon a couple of recent activities, the following are examples of how this project could help bring UTCA participants from the various campuses together:

1. The UAB Department of Surgery and *Center for Injury Sciences* hosted a visit by Dr. Leonard Evans on September 21st and 22nd. Dr Evans is a well-known expert in transportation safety engineering, president of *Science Serving Society*, and author of the book entitled *Traffic Safety and the Driver*. He gave a presentation entitled "Human Harm from Traffic Crashes" that was open to all university researchers and that is perfectly in line with the UTCA theme. The SLSI project could help advertise and share these activities with UTCA participants outside of UAB and encourage them to participate.
2. Area 17 of the National Cooperative Highway Research Program (NCHRP) deals specifically with transportation safety, and many of the projects must have a strong injury analysis and epidemiology component combined with civil engineering aspects of transportation safety. For example, the recent RFP for NCHRP Project 17-22, "Identification of Vehicular Impact Conditions Associated with Serious Run-Off-Road Crashes", identifies one of the objectives as "to identify the vehicle types, impact conditions, and site characteristics associated with serious injury and fatal crashes . . . ". UTCA faculty across the three campuses could combine their strengths to form very strong teams for pursuing such opportunities and the SLSI project could help facilitate the needed relationships.
3. The UTCA project of Dr. Michele Bunn and Dr. Grant Savage entitled "Feasibility Of An Integrated Traffic Management and Emergency Communication System For Birmingham, Alabama" has made tremendous progress towards bringing Birmingham traffic management expertise and stakeholders together to explore an integrated traffic management and emergency communication system for Birmingham. One aspect of this discussion has been the potential implementation of emergency service notification referred to as Automatic Collision Notification (ACN). In essence, the idea of ACN is that appropriate emergency 911 controllers will be automatically contacted through a cell phone link by the occurrence of an automobile crash and that information such as location and the severity of the crash will be relayed. Furthermore, through accelerometer data within the automobile that is automatically relayed, emergency personnel can be provided an indication of what type of injuries can be expected. There is no question that this would save lives. Furthermore, the technology needed for ACN is currently available; in fact, the technology and its implementation for ACN has already been demonstrated by the *Center for Transportation Injury Research* (CentTIR) and Veridian, Inc., of Buffalo, New York (visited by Dr. Davidson on November 13, 2000).

Although the technology for an ACN is established, there are many challenges that must be overcome before the idea can be widely implemented. These challenges include very difficult system integration issues as well as injury research needed to relate type of vehicle, occupant attributes, and crash attributes to the resulting injuries. A collaborative team comprised of ITS expertise from one of the UTCA campuses, automobile crash and injury analysis expertise at UAB, plus outside expertise from CenTIR and Veridian could tackle some of the difficult problems that must be solved before ACN can be implemented.

4. Conclusions and Recommendations

The project successfully completed its objectives of developing a tool that will help facilitate relationships between UTCA participants and other transportation-safety focused researchers. A web page entitled "Saving Lives with Shared Information (SLSI)" that links UTCA participants to information about the other safety-related organizations was developed by students involved in the project. The web page can be reached through the UTCA homepage or directly by pointing a browser to www.eng.uab.edu/cee/SLSI/slsimain.html. The current version of the web page contains over 40 links. In addition to providing links that may be useful to UTCA participants, the web page provides a brief description and contact information for the each center and organization listed. Researchers associated with several of these centers and organizations were visited.

The project also achieved its goal of introducing undergraduates interested in graduate studies in transportation to research in transportation safety. Three students who participated in the project decided to pursue a master's degree in civil engineering. Also, the project helped to facilitate the involvement of summer REU students into transportation safety activities as well as to incorporate these activities into the classroom.

However, the web page was posted in August 2000, and has not been in place long enough to be widely used by UTCA participants in developing collaborative proposals. Since a link to the SLSI web page is provided on the UTCA web page, more and more UTCA participants will become aware of this resource. Other opportunities such as inter-campus (joint) faculty retreats and organized meetings of UTCA participants and investigators may also help advertise the resource. The following are recommendations for increasing the effectiveness of this program:

1. Continue improvements and additions to the SLSI web page. This project is essentially a service to UTCA. With the link to SLSI prominently displayed on the UTCA homepage, it will become noticed and used by UTCA participants. There is ample room to enhance the SLSI page, to improve its organization, and to make its appearance more appealing.
2. Expand the SLSI links beyond the automobile safety and injury-related links. So far, the focus of the SLSI web page has been on the transportation safety activities in which Dr. Davidson has been involved. There are many other transportation safety links such as other university transportation centers, the National Cooperative Highway Research Program (NCHRP), the American Association of State Highway Transportation Officials (AASHTO), etc., that would be valuable additions to the SLSI web page. As an example of why this is needed, researchers from the School of Public Health and the School of Medicine are rarely aware of opportunities such as NCHRP, yet participation by researchers in these areas is needed to accomplish the goals of many of the NCHRP safety-focused projects. As SLSI is expanded, its links

could be categorized. Other UTCA faculty and outside reviewers could provide valuable suggestions for additions and improvements.

3. Create a summary of specific expertise of UTCA faculty. The SLSI web page could be greatly enhanced by adding a brief bio from each UTCA faculty with expertise in some aspect of transportation safety and with interest in pursuing collaborative research. Such a bio page could describe the investigator's background, areas of expertise, interests, contact information, and could provide a link to the investigator's home page. This information would advertise the capabilities of UTCA faculty and help to facilitate and encourage collaboration between UTCA faculty.
4. Visit persons responsible for transportation safety and transportation planning in Alabama. Due to time and resource limitations, it was not possible to meet with representatives from each center/organization represented by the SLSI links. Many centers and researchers who directly relate to the current activities and ambitions of the UAB Department of Civil and Environmental Engineering were visited. And Dr. Davidson participated in meetings with Alabama transportation focuses such as the Alabama Department of Transportation *Forty-third Annual Transportation Conference* and meetings organized by Drs. Bunn and Savage as part of their UTCA project entitled "Feasibility Of An Integrated Traffic Management and Emergency Communication System For Birmingham, Alabama". However, future efforts should place more emphasis on visiting persons responsible for transportation safety and transportation planning in Alabama.
5. Conduct UTCA conferences. A conference where UTCA participants get together and share the results of their projects would be valuable to all UTCA participants. It would give the opportunity to present the work of this project, encourage UTCA participants to use the resource, provide an opportunity for suggestions, and provide the opportunity for participants to become aware of the expertise and interests of other participants.

Saving Lives with Shared Information (SLSI)

Welcome the SLSI web site. This web site was developed to facilitate communication and collaboration between UTCA participants and other transportation-focused researchers. Below is more information about the project, plus links to sites that may be useful to UTCA participants who are interested in developing research proposals that involve transportation safety and injury related research objectives. The development of this site is on-going, so we welcome any suggestions for additions or improvements. If you are involved in activities that may be useful to add to this web page, please let us know.

The development of this site is sponsored by the University Transportation Center for Alabama (UTCA), which is administered and coordinated jointly by the University of Alabama (located in Tuscaloosa), the University of Alabama at Birmingham (UAB), and the University of Alabama in Huntsville (UAH).

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[Acknowledgements](#)

[More about the Project](#)

[Links to other Transportation Safety-Related web sites](#)

SLSI Web Links

[Advocates for Highway and Auto Safety](#)

[Association for the Advancement of Automotive Medicine \(AAAM\)](#)

[Bureau of Transportation Statistics \(BTS\)](#)

[Bioengineering Center of Wayne State University](#)

[Biomechanics World-Wide](#)

[Communications for Coordinated Assistance and Response to Emergencies \(ComCARE\) Alliance](#)

[Commercial Vehicle Safety Alliance \(CVSA\)](#)

[Crash Injury Research & Engineering Network \(CIREN\)](#)

[Critical Analysis Reporting Environment \(CARE\)](#)

[Department of Transportation \(DOT\)](#)

[Drexel Intelligent Infrastructure and Transportation Safety Institute \(DI3\)](#)

[ESI Group](#)

[Fatality Analysis Reporting System \(FARS\)](#)

[Federal Highway Administration \(FHWA\)](#)

[Insurance Institute for Highway Safety \(IIHS\)](#)

[Injury Control Research Information Network \(ICRIN\)](#)

[International Journal of Crashworthiness](#)

[Iowa Injury Prevention Research Center \(IIPRC\)](#)

[Knott Laboratory, Inc.](#)

[MADYMO, Division of TNO's Crash Safety Center](#)

[Mercedes-Benz CIREN Center at UAB](#)

[National Aging Information Center](#)

[National Highway Traffic Safety Administration \(NHTSA\)](#)

National Aging Information Center

National Automotive Sampling System (NASS)

National Center for Injury Prevention and Control (NCIPC)

National Crash Analysis Center (NCAC)

National Library of Medicine PubMed

Network of Employers for Traffic Safety

Renfroe Engineering, Inc.

Ryerson Polytechnic University - Vehicle Safety Research Center

Society of Automotive Engineers (SAE)

Strategic Crash Analysis and Response System (SCARS)

University of Alabama at Birmingham Center for Injury Sciences

University of Alabama at Birmingham Injury Control Research Center (ICRC)

University of Alabama at Birmingham Center for Aging

University of Michigan Transportation Research Institute (UMTRI)

University of New York at Buffalo Center for Transportation Injury Research (CentIR)

University of North Carolina Highway Safety Research Center (HSRC)

University Transportation Center for Alabama (UTCA)

University of Virginia Automobile Safety Laboratory (ASL)

Veridian Engineering's Automated Collision Notification (ACN) system

Visible Human Project

Saving Lives with Shared Information (SLSI)

ACKNOWLEDGMENTS

The development of this site is sponsored by the University Transportation Center for Alabama (UTCA), which is administered and coordinated jointly by the University of Alabama (located in Tuscaloosa), the University of Alabama at Birmingham (UAB), and the University of Alabama in Huntsville (UAH).

The web page is maintained by UAB Civil Engineering students who are involved in transportation safety research. In particular, Dan Connell, Anna Simpson, and Trey Gauntt played leading roles in building the web site and conducting the needed background research.

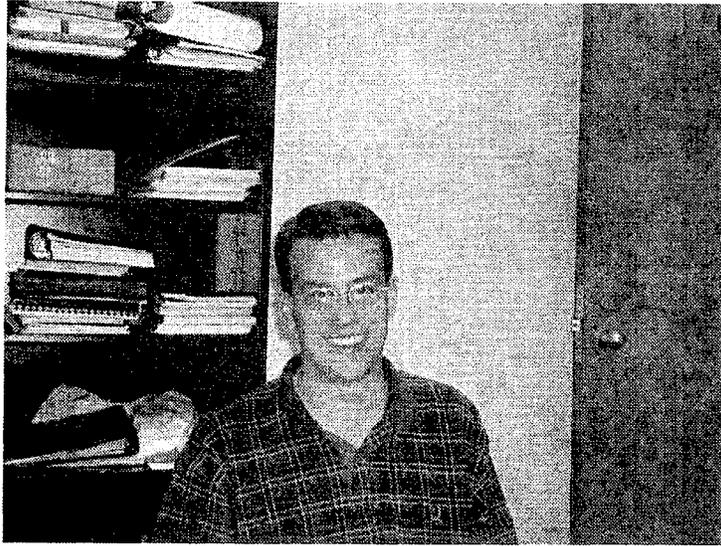
Dan Connell

Dan was the first student to work on the project. He collected many of the sources, put together the first version of the web page, and participated in CIREN crash investigations and meetings. Dan also began investigating software such as LS-Dyna, Madymo, and Articulated Total Body (ATB) that may be useful in occupant kinematic modeling. Dan decided to pursue his Master's degree and to focus on research that Dr. Davidson has with the Air Force involving the development and analysis of retrofit measures to protect occupants of buildings from the effects of blast. He completed his undergraduate curriculum in August 2000.



Trey Gauntt

Trey worked on the project for only a few weeks. He helped investigate links for the SLSI web page and collect transportation safety literature. Once Dr. Davidson initiated the UTCA county management project entitled "Local Roads Bridge Prioritization Database Program", Trey decided to work on that project. He has successfully completed several terms of his graduate coursework and is working diligently on the county management project.



Anna Simpson

Anna began working on the project in late Spring 2000 after expressing interest in the subject and in pursuing a Master's degree. Anna helped investigate links for the SLSI web page, collect transportation safety literature, and participate in CIREN activities. She also finished her undergraduate civil engineering curriculum Spring 2000. Anna worked part-time on the project through Summer 2000 and began full-time graduate research and coursework in the Fall. She plans to focus her research on head injury causation in automobile crashes.



Association for the Advancement of Automotive Medicine (AAAM)

The Medical Advisory Committee to the Sports Car Club of America established the American Association of Automotive Medicine (AAAM) in 1957. This sports car club was composed of six practicing physicians whose hobby was racing motor powered vehicles. These physicians realized the need for medical practitioners to be involved with the public motoring population in the area of injury control. Eventually, membership to the organization was given to people other than practicing doctors. Then, in 1987 the association's name was changed to the Association for the Advancement of Automotive Medicine. The AAAM's annual conferences are conduits for the flow of information in areas such as severity and patterns of injuries, occupant restraint systems, and vehicle crash worthiness. The standardization of traffic injury severity information is a major issue also dealt with by the AAAM.

Contact Information:

*Association for the Advancement of Automotive Medicine
2340 Des Plaines Avenue, Suite 106
Des Plaines, Illinois 60018, USA*

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Fax: 847-390-9962

E-mail: AAAM1@aol.com

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Veridian Engineering's Automated Collision Notification (ACN) system

The Automated Collision Notification (ACN) system was developed to improve emergency response times to automotive accidents. Improving emergency response times has the potential of saving many lives. Veridian, with support from NHTSA, has developed a system that will automatically notify emergency services when a vehicle has been involved in a serious collision. The system requires no action on the part of the passengers and is totally independent from all other systems in the vehicle.

Contact Information:

*Veridian
2001 North Beauregard Street, Suite 1200
Alexandria, Virginia 22311*

*E-mail: info@veridian.com
Fax: (703) 575-3240*

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Advocates for Highway and Auto Safety

Advocates for Highway and Auto Safety, founded in 1989, pursue policies and standards that will reduce the number of fatal and costly accidents that occur each year. This organization deals with federal and state policies concerning occupant and consumer protection, vehicle crashworthiness, highway safety, impaired driving and speed. They play a major role in the development of these policies as well as increasing public awareness of highway and motor vehicle safety issues.

Contact Information:

*Advocates for Highway and Auto Safety
750 First St. NE, Suite 901
Washington, D.C. 20002*

*Tel: (202) 408-1711
Fax: (202) 408-1699
E-mail: advocates@saferoads.org*

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University of Virginia Automobile Safety Laboratory (ASL)

The University of Virginia Automobile Safety Laboratory (ASL) functions as a facility for safety-related testing and as a facility for the preparation of biomechanical materials. The facility is dedicated to safety testing, the study of biomechanics, and other engineering studies. The ASL has been emphasizing automotive safety since the late 1970's. Researchers have been developing a comprehensive approach to the design of crashworthy vehicles. Computer simulations have played a major role in optimizing the safety performance of different vehicle classes. The interactions of occupants and restraint systems along with other force-related studies are performed using the ASL's horizontal impact test sled system. The ASL also performs major research dealing with the biomechanics of lower limb injuries. This program covers most aspects of vehicle crashworthiness, computational mechanics, and impact biomechanics.

Contact Information:

*Automotive Safety Laboratory
1011 Linden Avenue
Charlottesville, VA 22901*

*Tel: (804) 296-7288
E-mail: asl-manac@virginia.edu*

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Biomechanics World-Wide

Biomechanics World Wide is designed to assist all persons in their search for information on the broad topic of Biomechanics. Generally it points to other biomechanics and related sites as well as files of relevant information. It also points to the individual 'home pages' of biomechanists in the world who wish to share their related knowledge and experiences.

Contact Information:

pierre.baudin@ualberta.ca

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Bureau of Transportation Statistics (BTS)

The Bureau of Transportation Statistics (BTS) was created in 1992 and operates under the U.S. Department of Transportation. The BTS must meet certain requirements set by the Intermodal Surface Transportation Efficiency Act of 1991. Improving the knowledge base for public decision-making is the first of these requirements. The second requirement is to increase public awareness of our transportation system and its consequences. BTS is involved in data collection and statistical analysis. They are responsible for ensuring the quality and usefulness of transportation statistics. BTS also has the task of making transportation statistics accessible and understandable. BTS makes much of this information available through the National Transportation Library. The information in the library is in the public domain.

Contact Information:

*Bureau of Transportation Statistics
400 Seventh Street, S.W.
Washington, D.C. 20590
Main Office: (202) 366-1270
Main Fax: (202) 366-3640*

*BTS Products: (202) 366-DATA, orders@bts.gov
Statistical Information: 1-800-853-1351, statistics@bts.gov
Freedom of Information Act (FOIA), [Homepage and Contacts](#)
webmaster@bts.gov*

*For list of contact persons and telephone numbers go directly to
the [BTS Contacts](#) page.*

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Critical Analysis Reporting Environment (CARE)

The CARE software system was designed to allow members of the traffic safety community to access information concerning automotive accidents and incidents. The format of the CARE software system is one that does not require the user to have any expertise in the computer field. There are two platforms from which CARE can be used: desktop and web-based. CARE was specifically designed for the identification of problems and the development of countermeasures to combat these predicaments. CARE uses a central database and/or local level entry to gain access to its source data. This provides several advantages that help problem identification. CARE produces results in a matter of seconds, which allows the user to alter and/or modify search efforts so that specific information can be found in a very reasonable amount of time. CARE also generates information using a comparison of subsets of data. This allows multi-parameter searches for very specific information to be conducted.

[Question/Feedback Form](#)

Contact Information:

Dr. David Brown
David Brown
Computer Science Department
The University of Alabama
CARE

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Crash Injury Research & Engineering Network (CIREN)

The CIREN Network was created in 1996 by the Volpe National Transportation Research Center (VNTSC) in Cambridge, Massachusetts. This network supports the transfer of potentially life saving information, concerning highway crashes, between CIREN Centers that are located across the United States. Each of these centers is staffed by a multidisciplinary team of medical practitioners and engineers. The ultimate goal of each center is to collect and analyze data from real highway accidents so that research in the areas of prevention, treatment, and rehabilitation can be performed. This research will ultimately be used in real world applications. Currently, there are eight active CIREN Centers. Each of these centers is a level 1 trauma center. A level 1 trauma center is traditionally a "teaching" institution. Follow the link to a list of links to the CIREN Centers and their corresponding academic supports.

Contact Information:

[CIREN Site Webmaster](#)

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Communications for Coordinated Assistance and Response to Emergencies (ComCARE) Alliance

The ComCARE Alliance is working to develop a system that will efficiently connect the nation's mobile public to emergency agencies and increase public safety. An end-to-end emergency communication system is the goal of the ComCARE Alliance. This system is being developed with the help of many organizations and companies. The wireless communications companies play an important part in this alliance because a major component of this system is going to rely on the public's use of cellular phones. Monitoring the numbers of cellular phones in use in particular areas can give very good measures of traffic congestion and information at any given time. A system to track cellular use is presently being put into place in Maryland and Virginia to test its effectiveness at measuring highway congestion.

Contact Information:

*ComCARE Alliance
12th Floor
888 17th Street, NW
Washington, D.C. 20006*

*Tel: (202) 429-0574
Fax: (202) 296-2962
E-mail: info@comcare.org*

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International Journal of Crashworthiness

The International Journal of Crashworthiness is a journal devoted to all aspects of the crash behavior of structures, materials, and impact biomechanics. The International Journal of Crashworthiness provides an authoritative forum for the publication of original research and applied work fundamental for researchers, engineers and designers. The Journal covers all matters relating to crashworthiness of:

- Road vehicles
- Rail vehicles
- Air and spacecraft
- Ships and Submarines
- On- and off-shore installations

The issues addressed include the quality of response of materials, body structures, and energy-absorbing systems subject to sudden dynamic loading. Also included is the subject of impact biomechanics, which can be broadly categorized into human response, mechanics of injury, human tolerance, development of human surrogates for impact simulation and occupant protection in general.

Contact Information:

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wp@woodhead-publishing.com - www.woodhead-publishing.com

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Fax: +44 (0) 1204 381107 / 399094
E-mail: eccl@bolton.ac.uk

Commercial Vehicle Safety Alliance (CVSA)

The Commercial Vehicle Safety Alliance (CVSA) is a non-profit organization of federal, state, and provincial government agencies and representatives from private industry in the United States, Canada and Mexico dedicated to improving commercial vehicle safety.

The Alliance serves as the major focal point for bringing together state/provincial officials with truck/bus industry interest and federal governments in a unique discussion and problem solving interchange. The goals of this organization are: 1) Reduce fatalities, injuries, and incidents by improving safety compliance of commercial vehicle operations through form and reciprocal standards, practices, and enforcement throughout North America. 2) Establish and maintain effective CV safety operational standards and practices, inspection procedures, out-of-service criteria, and enforcement practices and penalties that provide the basis for uniformity, compatibility and reciprocity among CVSA's member jurisdictions and industry partners. 3) Seek and establish partnerships with others with interests in CV safety that lead to greater influence, higher visibility, and more effectiveness in pursuing CVSA's mission. Seek and establish understanding with the general public of North America by educating and informing them of CVSA's vision and mission. 4) Maintain an efficient organizational structure that provides the leadership and guidance needed to focus on strategic priorities. Improve processes and mechanisms for addressing CVSA goals and priorities effectively. Prioritize actions and align resource bases (funding, facilities, staff and others) sufficient to support the mission of the Alliance.

Contact Information:

amyd@cvsa.org

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Drexel Intelligent Infrastructure and Transportation Safety Institute (DI3)

In 1997, Drexel University created the Drexel Intelligent Infrastructure and Transportation Safety Institute (DI3). DI3 is funded by the U.S. Congress and serves as a national model for other research institutes involved in civil infrastructure systems. The performance and longevity of these infrastructure systems are important to the nation's economy and safety. DI3 has capabilities that can be applied to many areas such as Condition Assessment, Loading Effects, Failure Mode Analysis, and Life-Cycle Health Monitoring. DI3 also coordinates academic, government, and industry partners so that their combined technologies and capabilities can be used to study, understand, and improve the nation's civil infrastructure systems.

Contact Information:

[DI3 Contact Information Page](#)

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Department of Transportation (DOT)

The United States Department of Transportation (DOT) embodies many autonomous agencies dealing with many aspects of transportation. Aviation, railroad, maritime, and, most importantly, highway traffic safety issues are dealt with and supported by the DOT. Since traffic safety is a major concern, the DOT oversees numerous traffic related organizations. The NHTSA and the FHWA are two of the previously discussed organizations.

Contact Information:

[Contact Information Page](#)

[National Highway Traffic Safety Administration \(NHTSA\)](#)

[National Automotive Sampling System \(NASS\)](#)

[Fatality Analysis Reporting System \(FARS\)](#)

[Federal Highway Administration \(FHWA\)](#)

[Bureau of Transportation Statistics \(BTS\)](#)

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ESI Group

ESI Group products allow engineers to explore design and process alternatives without building physical prototypes. ESI Group invented the Virtual Try-Out Space. A pioneer and major actor in numerical simulation for applied mechanics, ESI Group provides virtual prototyping and manufacturing software. ESI Group solutions optimize performance of products and manufacturing process in the areas of transportation safety, manufacturing as well as the impact of these products on the environment. ESI Group's goal is to help industrial companies shorten their time to market, enhance the quality of their products and cut costs by taking into account the properties of material physics rather than simply the basic geometric and kinematic features. Worldwide staff includes about 300 people in the United States, Europe, and Asia. A global network of agents provides sales and technical support to customers in more than 20 countries.

Contact Information:

*ESI North America
13399 West Star
Shelby Township
MI 48315-2701
U.S.A.
Tel: +1 (810) 323 4610
Fax: +1 (810) 323 4611
Contact: info@esidetroit.com*

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Fatality Analysis Reporting System (FARS)

Established in 1975, the Fatality Analysis Reporting System (FARS) embodies data from all 50 states, including Puerto Rico and the District of Columbia, pertaining to fatal traffic accidents. This data contains information about driver, passenger, and pedestrian fatalities. The National Center for Statistics and Analysis (NCSA) developed FARS to assist the traffic safety community in its ongoing efforts to identify traffic safety problems. The need for the evaluation of safety standards and the development of fatality preventing measures for the vehicle and operator also instigated the design and implementation of FARS. The mission of FARS is to make information available that will ultimately improve traffic safety.

Contact Information:

[Contacts/Comments](#)

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Federal Highway Administration (FHWA)

The FHWA plays a major role in supplying technical expertise that will help fulfill the future transportation needs of the United States of America. Topics of importance that the FHWA is involved in are: bridge and roadway design, construction, and maintenance; highway and motor vehicle safety; environmental protection and enhancement; and research, development, and technology transfer. The FHWA is responsible for the development and implementation of policies, regulations, and guidelines regarding the safety and economic growth aspects of the transportation infrastructure. Many services such as technical training, education, and assistance are available to other transportation agencies. In addition, the promotion of safety practices concerning highway design/use and the funding of emergency relief for repairs to federally owned roads damaged by natural disasters are areas in which the FHWA excels.

Contact Information:

[Contacts/Customer Service Page](#)

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University of North Carolina Highway Safety Research Center (HSRC)

The UNC Highway Safety Research Center (HSRC) was founded in the mid 1960's. The formation of the HSRC coincides with an increase in concerns about highway safety. Many people were calling for a broadening of highway safety. This would include focuses on vehicle safety and forgiving highways. The design of motor vehicles and roadways to reduce serious injuries and fatalities were the main issues that needed to be addressed. Since its formation, the HSRC has made many contributions to the field of highway safety. The HSRC was the first to compare automobiles from different manufacturers and look at the levels of injury production. The HSRC has also been heavily involved in child restraint and adult seatbelt laws. They have also had great influence in removing the drunk driver from the roadways, creating new regulations that set minimum ages for school bus drivers, and in implementing "graduated licensing" for young drivers. These are just a few of the important contributions that the HSRC has made to highway safety.

Contact Information:

*The University of North Carolina Highway Safety Research Center
CB# 3430
Chapel Hill, NC 27599*

*Tel: (919) 962-2202
In NC: (800) 672-4527*

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The University of Alabama at Birmingham Injury Control Research Center (ICRC)

The UAB Injury Control Research Center (ICRC) was established in 1988 by the University of Alabama system trustees. One of the main goals of the center was to become a significant participant and a meaningful contributor to programs and activities that might arise from the CDC's national injury control itinerary. The UAB ICRC strives to improve processes that will benefit persons with injuries and help them reach their maximum potential. Through research, training, and public service projects, a stimulation in the areas prevention, biomechanics, and rehabilitation is hoped to be achieved. Providing technical assistance and useful information that supports the nation's injury control agenda is also a major part of UAB's plans for the ICRC.

Contact Information:

[Wendy Horn](#)

[Chris Hardin](#)

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Injury Control Resource Information Network

ICRIN is a dynamic list of key Internet accessible resources related to the topic of injury research and control. The web site is sponsored by the Center for Injury Research and Control (CIRCL) at the University of Pittsburgh Medical Center. CIRCL is an interdisciplinary, comprehensive program involving six schools and 18 departments of the University of Pittsburgh. The Center conducts injury control research, gathers and disseminates information on injuries, provides training for health care professionals, and informs the public and community leaders on injury control measures. CIRCL was established in July 1992. In September 1995, it became one of ten centers in the country to receive official designation as an Injury Control Research Center by the Centers for Disease Control and Prevention (CDC).

Contact Information:

Center for Injury Research and Control (CIRCL)
University of Pittsburgh, Pittsburgh, PA
Hank Weiss MS, MPH, PhD Visiting Research Professor
Co-WebMaster: Gerald McGwin Jr. MS, PhD

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Insurance Institute for Highway Safety (IIHS)

The Insurance Institute for Highway Safety (IIHS) is a research-oriented organization that is highly involved in highway safety issues. The IIHS conducts research on countermeasures that address all factors in motor vehicle accidents. The major factors are human, environment, and vehicle. The human factor deals with impaired driving, driver fatigue, etc. Roadside hazards, run-off-the-road accidents due to roadway design, and other physical problems associated with driving environment are the focus of the environment factor in accidents. Vehicle factors include crash avoidance and crashworthiness. The IIHS has a major focus on the crashworthiness of vehicles. They opened their Vehicle Research Center in 1992. The VRC performs fully instrumented crash tests on vehicles to obtain an understanding of the mechanisms that cause occupant injury. The VRC conducts airbag, side impact, rear impact, and low-speed crash tests that simulate real-world crashes. The center also investigates real crashes involving restrained occupants to gain a better understanding restraint systems and other crashworthiness issues.

The IIHS also publishes crashworthiness evaluations of many late model cars. These vehicles are rated from good to poor based on their performance during a forty mile per hour frontal offset crash test. The results of the tests are posted on their web site in the Vehicle Ratings area.

Contact Information:

*Insurance Institute for Highway Safety
1005 N. Glebe Road, Suite 800
Arlington, VA 22201 USA*

*Tel: (703) 247-1500
Fax: (703) 247-1588*

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Iowa Injury Prevention Research Center

The University of Iowa Injury Prevention Research Center (IPRC) addresses this important public health problem. Founded in 1990, the IPRC is one of ten injury "Centers of Excellence" funded by the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. The theme of the Iowa center is prevention and control of rural injuries. Based on epidemiological data, rural populations at high risk of injury include children, the elderly, farmers and farm families.

The IPRC aims to prevent and control injuries in these high-risk rural populations by supporting research and training and by disseminating research results to policy makers. The University of Iowa Injury Prevention Research Center is organized around three cores, three facilities, numerous research projects and a pilot research grant program involving faculty from four colleges and 16 departments at The University of Iowa.

Midwest Injury Prevention Consortium: The Midwest Injury Prevention Consortium provides an outreach mechanism for the IPRC to promote and advocate injury prevention in Iowa and the Midwest and to serve as a national resource for rural injury prevention. Members include representatives from state and federal health departments, transportation departments, and other organizations interested in injury prevention.

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Knott Laboratory, Inc.

Knott Laboratory is committed to providing professional, reliable, engineering and biomechanical support. The staff of advanced-degreed engineers and biomechanists provides the highest level of accurate, honest and dependable service. Extensive animation and graphics capabilities are offered, created by qualified engineers, to visually support individual cases. Since 1982, Knott Laboratory has contributed investigation, research, support, and expert testimony to a variety of failure analysis cases including accident reconstruction, product liability, slip/trip and fall, fire cause & origin, ballistics, and other related areas of engineering science. Knott Laboratory, Inc., has recently merged with Biomechanics Research & Consulting, Inc. of El Segundo, California and Evergreen, Colorado. The result is newly expanded and comprehensive engineering, biomechanics and animation services that are immediately available to all clients. Biomechanics Research & Consulting brings to Knott Laboratory its nationally acclaimed experience in automotive, sport/recreation and occupational accidents. Investigations are conducted by well-published professionals with advanced degrees. Research performed by Biomechanics Research & Consulting professionals has included full-scale vehicle-to-vehicle automobile crash tests with live human subjects and sled tests with Hybrid III crash test dummies and human cadavers. The scope of their research covers cervical and lumbar spine injury biomechanics, chest impact injuries, seatbelt restraint and related injuries, upper and lower extremity kinematics, traumatic and overuse knee injuries, and child restraint safety.

Contact Information:

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Telephone: 303.925.1900*

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MADYMO, Division of TNO's Crash Safety Center

MADYMO is an engineering software tool that allows users to design and optimize occupant safety systems efficiently, quickly and cost-effectively. MADYMO is the worldwide standard for occupant safety analysis. It is used extensively in industrial engineering, design offices, research laboratories and technical universities. It has proven itself in numerous applications, often supported by verification studies using experimental test data. The Crash Safety Centre has a wide range of facilities and expertise available, tailored to meet the research and development needs of international industries, governments and other organizations concerned with crash safety. Main areas of specialization are: injury biomechanics, human modeling, crash dummies, crashworthiness, restraint systems, material technology, engineering, simulation software and crash testing.

Contact Information:

*Crash Safety Centre
P.O. Box 6033
2600 JA Delft
The Netherlands
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Fax: +31 15 262 43 21
E-mail: crash-safety@wt.tno.nl*

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National Aging Information Center

In response to the growing number of older people and their diverse needs, the Older Americans Act of 1965 as Amended calls for a range of programs that offer services and opportunities for older Americans, especially those at risk of losing their independence. The Act established the Administration on Aging (AoA), an agency of the U.S. Department of Health and Human Services, which is headed by the Assistant Secretary for Aging in the Department. AoA is the Federal focal point and advocate agency for older persons and their concerns. In this role, AoA works to heighten awareness among other Federal agencies, organizations, groups, and the public about the valuable contributions that older Americans make to the Nation and alerts them to the needs of vulnerable older people. Through information and referral and outreach efforts at the community level, AoA seeks to educate older people and their caregivers about the benefits and services available to help them.

As individuals age, changes in vision, physical strength and cognition can contribute to a loss of self-confidence and ability to operate a motor vehicle or use public transportation systems requiring self-locomotion for access and connectivity. The prospect of losing one's mobility is equated by many to mean a loss of independence and personal freedom. Faced with this choice, some older adults risk personal injury rather than give up their driver's license. Internet sites selected here reflect a broad spectrum of public policy viewpoints associated with these issues as well as resources and information on paratransit systems and tips for traveling.

Contact Information:

Administration on Aging

330 Independence Avenue, SW

Washington, D.C. 20201

Telephone:

(800) 677-1116 (Eldercare Locator - to find services for an older person in his or her locality)

(202) 619-7501 (AoA's National Aging Information Center -- for technical information and public inquiries)

(202) 401-4541 (Office of the Assistant Secretary for Aging) (Congressional and Media Inquiries)

FAX: (202) 260-1012

AoAInfo@aoa.gov

[AoA Customer Service Page](#)

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National Automotive Sampling System (NASS) program

Established in 1979, the National Automotive Sampling System (NASS) program was implemented in an effort to lower the number of accidents, injuries, and fatalities occurring on the nation's highways. The NASS program developed a Crashworthiness Data System (CDS) to help collect data concerning motor vehicle accidents. The NASS CDS contains data ranging from minor to serious accidents. Accidents involving passenger cars, utility vehicles, light trucks, and vans are the primary sources of the field data. Field research teams who investigate approximately five thousand accidents per year collect this data. The data includes detailed information from the crash site, vehicle(s), and persons involved. This information is used to assess traffic safety, identify traffic safety problems, and analyze vehicle safety standards.

Contact Information:

Ms. Louann Hall
Tel: 1-800-934-8517
Fax: (202) 366-7078
E-mail: ncsaweb@nhtsa.dot.gov

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National Crash Analysis Center (NCAC)

The FHWA/NHTSA National Crash Analysis Center (NCAC) is a federally funded research center concentrating on vehicle crash research. The NCAC is located on the Virginia campus of George Washington University.

Today's complex transportation issues and automotive designs require the ability to synthesize data from diverse disciplines to find innovative solutions to safety concerns. Automobile safety combines advanced restraint systems including airbags and automatic retracting seat belts, anti-lock brakes, sophisticated structure designs and crumple zones, and safer occupant compartments. The design and analysis of these components is placing a demand for engineers with interdisciplinary backgrounds covering a spectrum of areas including nonlinear structural analysis, biomechanics, thermo fluid dynamics, computer simulation, and statistics. This site includes information on vehicle modeling research, advanced automotive concepts, biomechanics and safety research, advanced simulation and analysis training, and roadside hardware research. Additionally, the site contains an extensive archive of impact simulations. Finite element models are also available for downloading (free of charge) from the NCAC site.

Contact Information:

*National Crash Analysis Center
George Washington University Campus (Virginia), Suite 327
webmaster@ncac.gwu.edu*

*For information relating the downloading FE Models, contact:
Professor Steve Kan cdkan@ncac.gwu.edu
Dr. Dhafer Marzougui dmarzoug@ncac.gwu.edu*

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Centers For Disease Control and Prevention (CDC) – National Center for Injury Prevention and Control

The National Center for Injury Prevention and Control (NCIPC) works to reduce morbidity, disability, mortality, and costs associated with injuries. The U.S. Centers for Disease Control and Prevention (CDC) began studying home and recreational injuries in the early 1970s and violence prevention in 1983. From these early activities grew a national program to reduce injury, disability, death, and costs associated with injuries outside the workplace. In June 1992, CDC established the National Center for Injury Prevention and Control (NCIPC). As the lead federal agency for injury prevention, NCIPC works closely with other federal agencies; national, state, and local organizations; state and local health departments; and research institutions.

The NCIPC extramural research program funds and monitors research in three phases of injury control: prevention, acute care, and rehabilitation. The program also funds research in the two major disciplines used in injury control research: biomechanics and epidemiology. Research supported by the program focuses on the broad-based need to control morbidity, disability, death, and costs associated with injury. For the purposes of the research program, injury is defined as physical damage to an individual that takes place over a short period of time and is caused by physical energy in the environment, by chemical agents, or by the absence of essentials, such as oxygen. The research program classifies injuries as intentional, unintentional, or occupational: Intentional injuries result from interpersonal, or self-inflicted, violence and include homicide, assaults, suicide and suicide attempts, elder and child abuse, domestic violence, and rape. Unintentional, or unintended, injuries include those that result from such causes as motor vehicle crashes, falls, fires, poisonings, and drownings. Occupational injuries occur at the worksite and include unintentional as well as intentional trauma.

This web page provides access to **WISQARSTM** (Web-based Injury Statistics Query and Reporting System), an interactive system that provides customized injury-related mortality data useful for research and for making informed public health decisions. Also included is a listing of resources relating to injury care.

Contact Information:

*National Center for Injury Prevention and Control
Mailstop K65
4770 Buford Highway NE
Atlanta, GA 30341-3724*

*Phone: 770.488.1506
Fax: 770.488.1667
Email: OHCINFO@cdc.gov*

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Network of Employers for Traffic Safety

The NETS mission is to reduce traffic crashes involving America's workers and their families by helping employers implement well-developed policies, dynamic workplace programs, and compelling community activities related to traffic safety. Government and industry leaders created the organization to address the human and economic impact of traffic crashes on the nation's workforce as well as their families and communities.

NETS is the only national non-profit organization that focuses its efforts exclusively on introducing traffic to workplace safety management systems. The programs, products and services are designed to reach all employees and their families, not just fleet drivers.

Contact Information:

*Network of Employers for Traffic Safety
1900 L St. NW, Suite 705
Washington, D.C. 20036
Tel: 202-452-6005
Fax: 202-223-7012*

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National Highway Traffic Safety Administration (NHTSA)

NHTSA, established in 1970, was created for the purpose of lowering the number of deaths and injuries, along with reducing economic losses that result from automobile accidents. These goals are achieved by establishing and upholding safety performance standards for automobile equipment. Investigating safety defects, developing and implementing fuel economy standards, and promoting the use of auto-safety devices are also areas in which NHTSA operates. To insure continuing safety improvements, research into traffic safety and driver behavior is being conducted by NHTSA.

Contact Person:

NHTSA Site Webmaster

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National Library of Medicine PubMed

PubMed was developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM), located at the National Institutes of Health (NIH). It was developed in conjunction with publishers of biomedical literature as a search tool for accessing literature citations and linking to full-text journals at web sites of participating publishers. PubMed is the National Library of Medicine's search service that provides access to over 11 million citations in MEDLINE, PreMEDLINE, HealthSTAR, as well as Publisher-Supplied citations, with links to participating online journals. In addition, for electronically supplied journals that are indexed selectively for MEDLINE and include articles unrelated to medicine or the life sciences, PubMed includes all articles from that journal, not just those that are included in MEDLINE. It is expected that access to additional National Library of Medicine databases will be added in the future. PubMed also provides access and links to the integrated molecular biology databases included in NCBI's Entrez retrieval system. In collaboration with book publishers, the National Center for Biotechnology Information is adapting books for the web and linking them to PubMed. The first book, *Molecular Biology of the Cell* by Alberts *et al.*, is now available on PubMed's site.

Contact Information:

PubMed Help Desk:

pubmed@ncbi.nlm.nih.gov

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Renfroe Engineering, Inc.

Renfroe Engineering (RE) provides a full range of state-of-the-art services from the accident investigation to EDCRASH and EDSMAC computer analysis. RE has extensive experience with all types of accident reconstruction analysis and techniques such as photogrammetry, delta-V, crush, stiffness, moment of inertia, modeling, animation, etc. RE has laboratory facilities to perform extensive analysis on all types of safety restraint systems from actual bench scale testing of seat belt retractors and air-bag sensors to mathematical modeling of restraint systems to mathematical dynamic modeling. RE is a nationally recognized leader in the analysis of the complex dynamics of All Terrain Vehicles (ATVs). Accident reconstruction, vehicle measuring, and computer modeling is conducted. RE has extensive experience with the analysis of virtually all vehicle systems such as fuel, braking, and steering systems. Finite Element Analysis capabilities (using NISA) are available by which any particular component can be analyzed for failure due to vibration, stress, impact, etc. Reconstruction of rolls, rollover stability analysis, suspension system analysis, roof crush finite element analysis, and occupant motion simulation for injury causation are all tools that RE uses in analyzing vehicle rolls.

Contact Information:

*Renfroe Engineering, Inc.
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Farmington, AR 72730*

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Phone : (501) 846-8000
Fax : (501) 846-8002*

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Ryerson Polytechnic University - Vehicle Safety Research Center

The long-term objectives of the team relate directly to the objectives of the Road Safety and Motor Vehicle Directorate of Transport Canada as stated in the 1986 Annual Report are:

to contribute to a reduction in deaths, injuries, and property damage resulting from motor vehicle use, through improved safety of the motor vehicles.

The five main areas of activity addressed by this organization include: directed studies investigations, defect investigations, special investigations, community involvement and education, and professional development. The site provides information on current safety issues such as air bags, anti-locking brake systems, and hood openings due to safety latch corrosion. In addition, a number of links with other transportation-related web sites are included.

Contact Information:

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Society of Automotive Engineers (SAE)

This organization is a resource for technical information and expertise used in designing, building, maintaining, and operating self-propelled vehicles for use on land or sea, in air or space. SAE is a non-profit educational and scientific organization dedicated to advancing mobility technology to better serve humanity. All forms of self-propelled vehicles, including automobiles, trucks, and buses, off-highway equipment, aircraft, aerospace vehicles, marine, rail, and transit systems are covered by this society. Since its founding in 1905, SAE's dedicated people, strong technical base, and vision have helped serve the professional needs of engineers and the transportation needs of humanity. Nearly 80,000 engineers, businesses executives, educators, and students from more than 97 countries form our network of members who share information and exchange ideas for advancing the engineering of mobility systems. SAE disseminates this information through its meetings, books, technical papers, magazines, standards, reports, professional development programs, and electronic databases. SAE also offers a full complement of professional development activities such as seminars, workshops, and continuing education programs. The meetings and activities of local sections provide an opportunity to network with colleagues.

Contact Information:

By telephone

Main headquarters receptionist: 724/776-4841

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Membership: 1-800-TEAM-SAE

Washington, D.C. Office telephone number: 202/416-1649

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By e-mail

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foundation@sae.org

By mail (post)

SAE World Headquarters

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Strategic Crash Analysis and Response System (SCARS)

The Strategic Crash Analysis and Response System (SCARS) is a system developed by the University of Hawaii, Department of Urban and Regional Planning for improving the use of traffic records in highway safety. SCARS main goals are the identification of traffic safety problems, the design of solutions to traffic safety problems, and the evaluation of the outcomes and effectiveness of intervention programs and policies. The SCARS system is composed of multiple components that can be updated with new information along with changes in technology. This system is designed to serve the information needs of users ranging from researchers to traffic engineers to financial programmers. Even though most of the components of the SCARS system are working and in place, it is presently a prototype system.

Contact Information:

E-mail: karlk@hawaii.edu

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University of Alabama at Birmingham Center for Aging

The UAB Center for Aging seeks to enhance the health and well being of older people in Alabama, the United States, and the world through innovative research, education, and clinical programs in aging. The UAB Center for Aging is an interdisciplinary community that promotes the health and well being of older persons by:

- conducting and promoting age-related research,
- training students and faculty to conduct research,
- disseminating new knowledge, and
- supporting community outreach and clinical programs.

Contact Information:

Richard F. Ambrose at ambrose@uab.edu

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The Mercedes-Benz Crash Injury Research & Engineering Network (CIREN)

The UAB Mercedes-Benz CIREN Center was initiated in July 1999 and is the eighth such center in the country. Unlike any other CIREN Center, the first two years of the UAB center was voluntarily funded by industry (Mercedes-Benz). The activities of this center revolve around (1) collecting an immense amount of detailed information about specific automobile crashes that occur in the region and the injuries that result, (2) analyzing crash events and resulting injuries, (3) entering this information into the central CIREN database, and (4) presenting findings at quarterly CIREN conferences in Washington, D.C. The target is to collect and analyze 50 cases per year. The core UAB team is comprised of the following persons:

Trauma Surgeon - Dr. Loring Rue, M.D. (Director, P.I.)
Engineer - Dr. Jim Davidson, Ph.D. (Co-P.I., Associate Director)
Epidemiologist – Dr. Jerry McGwin, Ph.D.
Crash Investigator – Marilyn Doss
Nurse Coordinator – Holly Waller, R.N.

Contact Information:

Dr. Jim Davidson, Associate Director
jdavidso@eng.uab.edu

[CIREN overview presentation to the ALDOT Transportation Conference, February 2000](#)

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The UAB Center for Injury Sciences

The Center for Injury Sciences initiated activities in February 2000. The mission of this center is to provide multidisciplinary focus for the care of injured patients and for research related to both prevention and treatment of injuries. The center is directed by Dr. Loring Rue, M.D., Professor of Surgery and Chief of Trauma, Burns, and Critical Care. The center is especially working towards integrating engineering into injury research being conducted within the medical school.

Contact Information:

Dr. Jim Davidson
jddavidso@eng.uab.edu

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University of Michigan Transportation Research Institute (UMTRI)

The University of Michigan Transportation Research Institute facilitates multidisciplinary research in the field of transportation. UMTRI contains many facilities, which work together to create new and useful knowledge. The Biosciences facility, Engineering Research facility, Human Factors facility, and the Transportation Data Center are the main features at UMTRI. The Transportation Data Center houses a very large crash data database. Literally hundreds of separate data sets are available through the center. The center is also involved with NHTSA's National Center for Statistics and Analysis in some major data-collecting projects. The largest of these projects are the Fatal Accident Reporting System (FARS) and the National Accident Sampling System (NASS). The center also created and maintains a software package that allows access to the numerous sets of data. The Automated Data Access and Analysis System (ADAAS) provides keyword access to the available data along with some simple data-analysis functions.

Contact Information:

*University of Michigan Transportation Research Institute
2901 Baxter Road
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*Tel: (734) 764-6504
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E-mail: umtri@umich.edu*

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The University Transportation Center for Alabama (UTCA)

The Transportation Equity Act of the 21st Century (TEA 21) provided the U.S. Department of Transportation with funds that enabled them to award grants to universities across the nation. The purpose of these grants is support education, research, and the transfer of technology. This funding has lead to the development of numerous University Transportation Centers, each having their own themes. The University Transportation Center for Alabama (UTCA) theme is the "Management and Safety of Transportation Systems." UTCA has offices on the following campuses:

Main Office -- The University of Alabama (UA)

Local Offices -- The University of Alabama at Birmingham (UAB)

The University of Alabama in Huntsville (UAH)

Contact Information:

E-mail: utca@coe.eng.ua.edu

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Visible Human Project

The Visible Human Project has its roots in a 1986 long-range planning effort of the National Library of Medicine (NLM). It foresaw a coming era where NLM's bibliographic and factual database services would be complemented by libraries of digital images, distributed over high-speed computer networks and by high capacity physical media. Not surprisingly, it saw an increasing role for electronically represented images in clinical medicine and biomedical research. It encouraged the NLM to consider building and disseminating medical image libraries much the same way it acquires, indexes, and provides access to the biomedical literature. Early in 1989, under the direction of the Board of Regents, an ad hoc planning panel was convened and made the following recommendation: "NLM should undertake a first project building a digital image library of volumetric data representing a complete, normal adult male and female. This Visible Human Project will include digitized photographic images for cryosectioning, digital images derived from computerized tomography and digital magnetic resonance images of cadavers."

The Visible Human Project data sets are designed to serve as a common reference point for the study of human anatomy, as a set of common public domain data for testing medical imaging algorithms, and as a test bed and model for the construction of image libraries that can be accessed through networks. The data sets are being applied to a wide range of educational, diagnostic, treatment planning, virtual reality, artistic, mathematical and industrial uses by over 1,400 licensees in 41 countries.

Contact Information:

Visible Human Project
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894
FAX: (301) 402-4080
email: vhp@nlm.nih.gov
internet: www.nlm.nih.gov/research/visible/visible_human.html

Office of Communications and Public Liaison
National Library of Medicine
8600 Rockville Pike
Bethesda, Maryland 20894
Phone: (301) 496-6308
Fax: (301) 496-4450
email: publicinfo@nlm.nih.gov

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The Bioengineering Center of Wayne State University

The Bioengineering Center of Wayne State University has been a leader in bioengineering research for the last six decades. In the late 1930s, Wayne State University's College of Engineering and School of Medicine began working together to research and analyze the mechanisms of head injury. They have continued to make advances in the field of biomechanics. Their main areas of focus today are biodynamic response to impact acceleration, spinal biomechanics, and human trauma research. Major research programs dealing with side impacts, closed head injury, low back pain, bone mechanics, and sports biomechanics are currently underway. Many of their research projects have also been closely related to automotive safety standards.

Wayne State University has developed a unique Brain Injury Model (BIM). The BIM is an anatomically correct and complex model of the human brain and skull. Models of this type have the potential to be a basis for a new injury criterion. The current Head Injury Criterion (HIC) is based on the Wayne State Tolerance Curve published almost 40 years ago.

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