

About Us

The mission of the Center for Injury Biomechanics (CIB) is to reduce injury, disability, death, and associated societal costs.

Researchers at CIB study mechanisms of trauma to develop a greater understanding of human tolerance to injury, to engineer enhanced safety countermeasures, and to mitigate the occurrence of serious injury in society. CIB is an interdisciplinary research center that is a partnership between the Virginia Tech College of Engineering and the Wake Forest University School of Medicine.

- Injury Mitigation Research
- Impact and Injury Response and Tolerance
- Trauma Mechanisms
- Multiscale, Multimodal, Multirate Investigation
- Injury Risk Formulation
- Finite Element Modeling
- Physical and Numerical Surrogate Development
- Properties of Biological Materials
- Restraint System and Protective Equipment Evaluation
- Crashworthiness
- Crash Avoidance and Driver Assistance
- Statistical Studies



Programs



According to the Centers for Disease Control and Prevention, traumatic injuries are the leading killer of Americans in the first four decades of life. The goal of the CIB is to combine engineering and medical technologies to reduce the societal burden of injury.

CIB's research applies to transportation, recreation, and the military. CIB has a strong emphasis on automotive-related trauma, although rail, water, and aerospace issues are studied as well. The work performed by the CIB contributes to federal safety standards, and regulatory part design and use. In turn, this information is used to design safer vehicles, occupant compartments, and restraint systems such as seatbelts and airbags.

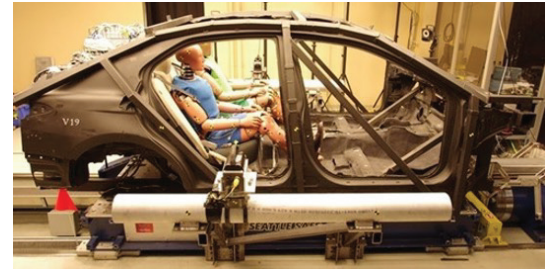
Our Impact



Highlighted Facilities

VTTI Crash Sled Lab

The VTTI Crash Sled Lab houses an impact laboratory, a high-speed biplane X-ray suite, and apparatus for testing material properties. The centerpiece of this lab is a 1.4 MN *ServoSled* System crash sled, used primarily in the study of transportation-related trauma with its chief applications found in the automotive environment.



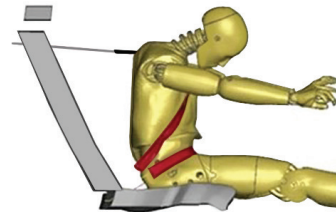
VTTI Blast Facility

Located in the CIB Sled Lab space, this facility has two state-of-the-art Advanced Blast Simulators designed to intrinsically replicate all the key features of blast wave flow conditions, including the negative phase and secondary shock.



VTTI Finite Element Modeling Cluster

The CIB has comprehensive computational modeling capabilities. This includes both finite element and lumped-parameter modeling. The response of complex vehicle structures, restraint systems, and the human body are examined using numerical simulations representing impact and blast environments.



CIB Labs at Wake Forest University

The CIB has extensive on-campus laboratory space at Wake Forest University in Winston-Salem, NC. A wide range of equipment is available in these labs, including tissue storage and handling facilities, instrumentation devices, high-speed video setups, modular testing systems, 3D printers, and a drop tower used to simulate impact events.



About VTTI

For 35 years, VTTI has been conducting research to save lives, time, and money and protect the environment. In our world-class facilities, we investigate, invent, design, develop, refine and test transportation systems of the future. As one of seven premier research institutes created by Virginia Tech to answer national challenges, VTTI is continually advancing transportation through innovation and has affected public policy on national and international levels.

To learn more about our work and get more involved, please contact us at:

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