ALTARUM INSTITUTE

SYSTEMS RESEARCH FOR BETTER HEALTH

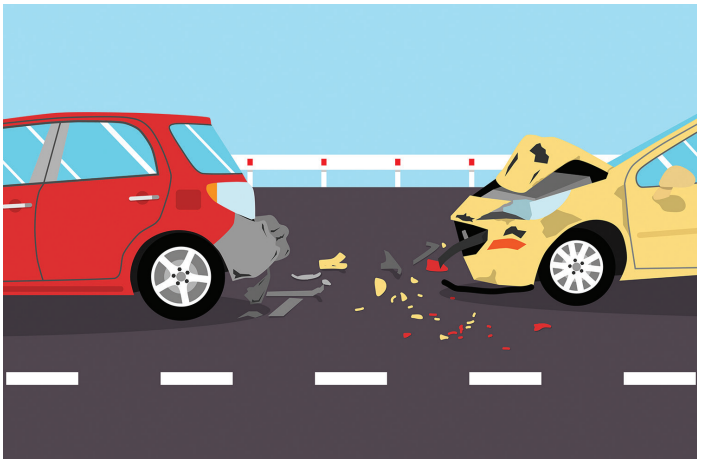
Center for Vehicle Safety

The Center's vision is to provide actionable roadmaps for individual drivers, policy makers, and automotive sector stakeholders to end vehicle-related crashes, injuries, and fatalities.

For more than 70 years, Altarum Institute has been improving human health by integrating research, technology, and analysis. Unfortunately, an alarming number of lives are still lost during vehicle crashes, and health-related costs associated with crashes are escalating. Annually, 4 million vehicle crashes injure drivers, passengers and pedestrians, and every 15 minutes of every day in the U.S., a person dies in a vehicle crash (i.e., 96 daily fatalities)[1].

These needless crashes have a devastating impact on our communities, health-care systems, and overall economy. 94% of vehicle crashes are caused by driver distractions and poor decision-making including speeding, cell phone use, fatigue or other driver impairment. While the steady introduction of advanced safety features help to save lives and reduce injuries, more health and safety research solutions are critically needed.

Altarum's health and vehicle safety research experts are committed to further understanding the complexity of vehicle transportation, engineering, and policy challenges. Our experts are thus working across the automotive super-highway system to identify compelling risk management policies, and to help reduce the billions in lost health-care costs from vehicle crashes. Altarum's innovative Vehicle Safety CRASH Tool has already predicted ways to instantly reduce road-way deaths by 37% that would save an astounding 12,076 U.S. lives annually



(i.e., 33 lives saved per day). The Center is helping to solve these issues by working diligently with our nationally recognized automotive safety partners to smartly reduce vehicle collisions, injuries, and fatalities.

Altarum's Vehicle Safety expertise includes:

- Research for crash-related health impacts and costs
- Analysis and evaluation of advanced vehicle safety features
- Development of vehicle safety program improvements and fleet management metrics
- Certified defensive driving experts and vehicle safety engineers to conduct roadway assessments
- Development and conduct of vehicle and occupant safety surveys
- Review of autonomous vehicle technology advance and implementation challenges

Altarum's Center for Vehicle Safety employs nationally recognized vehicle safety leaders holding multi-disciplinary credentials. We leverage these technical and programmatic safety leaders to help end vehicle-related crashes, injuries, and fatalities. Our Vehicle Safety experts have credentials including, but not limited to: driving instruction, engineering, ergonomics, hazardous materials, health care, program management, research, statistics, surveys, and traffic flagging.

A few of our key Vehicle Safety Leaders are:

MARSHALL CONTINO: Mr. Contino is the director of Altarum's Center for Vehicle Safety and has more than 20 years of programmatic and technical expertise in public safety and health. He has senior-level expertise providing support to vehicle safety, injury prevention, and risk management initiatives. Marshall works collaboratively with federal and commercial vehicle safety stakeholders to provide research data and leading edge vehicle safety solutions that reduce overall crashes, injuries, and fatalities. He leads the Institute's vehicle safety partnerships, and has coordinated highly automated vehicle (HAV) demonstration projects, testing and evaluation (T&E) data collection efforts, and vehicle safety policy implementation research. He led the development of comprehensive third party checklists to document the behavioral competencies of HAV systems, and led the conduct of safety and feasibility tests for HAV proving grounds. He has received formal training in traffic safety from the American Automobile Association (AAA), road flagging from the American Traffic Safety Services Association (ATSSA), defensive driving from the National Safety Council (NSC), and driver education from Porsche. Marshall is an experienced program manager, vehicle safety expert, mechanic and driver who has been participating in Drivers Education (DE) and High Performance Driving Clinic (HPDC) events across the country for 20 years. Most recently, he completed feasibility testing and safety assessments for a state of the art facility and highly automated vehicle proving grounds.

AMJAD QURESHI: Mr. Qureshi is co-director of Altarum's Center for Vehicle Safety and has more than 40 years of programmatic and technical expertise in public and occupational safety and health. He holds national board certifications as a Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH), and a Certified Hazardous Materials Manager (CHMM). He has authored dozens of Safety Management Plans (SMPs) for multiple world-class organizations and his scope of industry experiences spans commercial sectors, as well as United States federal and foreign governments. He served as a career naval officer, environmental and safety director for private companies, and as a federal agency safety officer. He specializes in safety and health management systems (SHMS), behavior-based safety (BBS), voluntary protection program (VPP), organizational risk management (ORM), business continuity management (BCM), business case analysis (BCA) and business process reengineering (BPR). He is a seasoned instructor and educator, and has developed and taught driving safety training for 30-plus years. Most recently, he completed a comprehensive SMP and comprehensive health, safety and environmental (HSE) assessment for a state-of the art facility and highly automated vehicle (HAV) proving grounds. Mr. Qureshi has also developed comprehensive testing and evaluation (T&E) protocols for conducting third party safety concept certification (TPSC2) programs, designed to assess the behavioral competencies of HAV systems.

CHUCK ALLARD: Mr. Allard has 40+ years of experience in systems engineering, operations, management, program, and project management. He has been the Chief of Instruction for the Washington DC Region, as well as the Porsche Club of America (PCA) Potomac Region. Mr. Allard formalized and produced the Sports Car Club of America (SCCA) Driver School Instruction package, and this training is now provided throughout SCCA. He has reviewed and audited driver safety training schools to observe instructors, curriculum, and instruction methods.

BOB BARNARD: Mr. Barnard is a qualified Civil Engineer, safety expert, and renowned motor race facility designer. He has a unique understanding of vehicle safety, roadway safety, and the business of motor sport through his work on four continents. His expertise spans designing and building tracks, owning and operating race facilities, working for teams and promoting events. Mr. Barnard is a track inspector and expert witness in motorsport litigation. He has designed, built, and operated iconic tracks including the Adelaide F1 Circuit, Phillip Island MotoGP Circuit, Road Atlanta and Daytona Speedway. Mr. Barnard has been a featured presenter to International Conferences regarding safety and design, and recently completed development for the Toyota Motor Company.

ANDY CROUTER: Mr. Crouter has more than 20 years of experience in probability, statistics, database development, programming, management, analytics, and data extrapolation. He has senior-level expertise writing SAS programs to extract, process, and analyze data. Mr. Crouter is a founding member of the Center for Vehicle Safety. He has received formal training in motorcycle safety from the National Safety Council (NSC) and Motorcycle Safety Foundation (MSF). He has been participating in motorcycle track day events across the U.S. for 15 years.

TATIANA DAVIS: Ms. Davis is a licensed professional engineer (PE) with more than 10 years of electrical and automation engineering experience in the automotive and oil and gas industries. She has specialized in the development of sensor technology and testing protocols, as well as vehicle performance analysis for a wide variety of high-performance sports cars, luxury vehicles, and sport utility vehicles (SUVs) for General Motors (GM). Her experience with the troubleshooting and resolution implementation of radio frequency sensors and temperature and pressure monitoring technology helped lead to drastically improved system performance and safety. Ms. Davis has also successfully designed, programmed, and implemented cutting edge automation systems and programmable logic controllers (PLCs) for Honeywell, ExxonMobil, and Shell.

MARTYN THAKE: Mr. Thake has more than 30 years of comprehensive motorsports experience including construction management, car design, racetrack facility design and management, event promotion, operations and logistics management, track inspections (for sanctioning bodies and insurance), and performance driving instruction. He has consulted for more than 100 facilities across the globe and has performed hundreds of inspections, designs and redesigns for CART/Champcar, IMSA, ALMS, FIA, IRL and SCCA. As an FIA inspector, he currently serves as the backup inspector for FIA-licensed tracks (Grade 2 or higher). Mr. Thake is a founding board member of the Motorsports Safety Foundation, and an active member of SAE and NFPA. Mr. Thake has also provided expert witness testimony in the areas of emergency services, safety, racetrack design, construction and management, car design, and manufacture and distribution.

[1] http://www.nhtsa.gov/About-NHTSA/Press-Releases/nhtsa_2015_traffic_deaths_up_07012016 (NHTSA Press Release, Friday, July 1, 2016, "NHTSA data shows traffic deaths up 7.7 percent in 2015)

For further information about Altarum's Vehicle Safety programs, please contact:
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