



STUDENT COMPETITION DETAILS



23RD INTERNATIONAL TECHNICAL CONFERENCE ON THE ENHANCED
SAFETY OF VEHICLES | MAY 27-30, 2013 | SEOUL, KOREA

5TH STUDENT SAFETY TECHNOLOGY DESIGN COMPETITION 2013

RESEARCH COLLABORATION TO BENEFIT SAFETY OF ALL ROAD USERS

A Message from the SSTDC



The 23rd ESV Conference Organizers welcome you to the 5th Student Safety Technology Design Competition (SSTDC), a competition that offers unique opportunities to students who compete. We invite all undergraduate and graduate students from our ESV member countries in North America, Europe and Asia-Pacific to consider participating.

WHAT IS THE SSTDC?

The Student Safety Technology Design Competition gives young scholars an exciting opportunity to design, build, and demonstrate a cost-effective conceptual scale model of a vehicle safety technology.

WHY PARTICIPATE IN THE SSTDC?

- To compete with other students and have the opportunity to present to a live audience of automotive safety professionals at an international technical conference. Finalists for the competition travel to Seoul, Korea for a final presentation.
- The three finalists' teams from each region compete for top honors at the 23rd ESV 2013 in Seoul, Korea, May 27 – 30, 2013 and their prototype devices are on display in the Exhibition Hall. An international panel of judges, made up of vehicle safety engineering experts from around the globe, will select a first-place winner team and a runner-up team, and both will receive an award and international recognition for their achievements.

WHO PARTICIPATES IN THE SSTDC?

- Participating teams must be from an ESV member country. Click here <http://www-esv.nhtsa.dot.gov/GFPs.htm> for a list of the 23rd ESV Government Focal Points and member countries.
- Teams consisting of university-level seniors and/or graduate students, guided by one faculty advisor, enter a 300-word abstract related to a global vehicle safety research priority. Entries are judged in each of the three geographical regions and six teams are selected to participate in their regional competition. A panel of safety experts visits each team's school and evaluates the designs, and selects three finalist teams per region.

HOW CAN I PARTICIPATE?

You can participate by submitting an entry to the SSTDC2013@dot.gov. The following Student Competition Details provide helpful information which includes the 2013 entry submission guidelines. For more information, you can contact Art Carter, the ESV Student Competition Organizer via email at Arthur.Carter@dot.gov.

Student Competition Details



Student entry in ESV 2011

COMPETITION OBJECTIVES

The Enhanced Safety of Vehicles (ESV) International SSTDC consists of the following:

- Identifying an important safety problem and developing the concept for an original vehicle-based technology to address this safety problem.
- Creating a functional scale or life size model of this vehicle-based technology.
- Documenting the development of the functional scale or life size model by presenting the results via a report and regional demonstration. Teams selected to participate in the final international judging will present their work orally and discuss the potential safety impact of the technology to the judges. They will also exhibit their safety inventions and devices during the ESV Conference in Seoul, Korea, in a special booth set up for the purpose.
- The participants in the final round will be required to make a 15 minute technical presentation at a special session set up for the purpose. The presentation will include a discussion of the safety problem being addressed, description of the countermeasures envisioned and potential safety benefits.
- The entry must contain a title, competition category, and a 300-word (maximum) abstract.

ENTRY REQUIREMENTS

- The abstract must outline the vehicle safety problem.
- The abstract must clearly identify the device or system that the team will build to address the safety problem outlined. It must also explain briefly how adoption of such a device or system could reduce the number of crashes, mitigate injuries, and/or prevent fatalities and injuries if deployed in vehicles and put into real-world operation in the fleet.
- To be considered, the entry must be submitted electronically by e-mail SSTDC2013@dot.gov by October 29, 2012.
- Upon receipt of each team's entry, the team lead will notify their faculty advisor.

FINANCIAL ASSISTANCE & CORPORATE SPONSORSHIP

Based on the competition criteria, a maximum of six teams will be invited to participate in their regional competitions. Each selected to compete in the regional competition for the United States will be awarded \$2,000 to help offset the costs involved in its design efforts. Teams selected to compete in the regional competition in other participating countries may be awarded up to the equivalent of U.S. \$2,000. Please contact your regional coordinator to determine if financial assistance is available in your country.

Teams are encouraged to seek corporate sponsors. Corporate sponsorship, to include funds to offset the costs of the design efforts is limited to the equivalent of U.S. \$3,000 per team, but corporate sponsorship is not a requirement. Total project costs must not exceed the equivalent of U.S. \$5,000 funding ceiling that includes any contributions from sponsors. The international finalist teams are permitted to seek additional funding beyond the U.S. \$3,000 to offset travel costs to and from the conference. Conference registration fees will be waived for a maximum of two team members from each of the nine international finalists.

Student Competition Details

CATEGORY DESCRIPTIONS

The student design must address a real-world vehicle safety problem from one of the following competition categories:

1. Electric Vehicle Safety (New Topic for 2013):

New system concepts that address safety issues in electric vehicles, e.g., preventing and detection of thermal runaway in lithium ion batteries, the communication of safety information unique to electric vehicles etc.

2. Autonomous Vehicle Issues (New Topic for 2013):

New concepts that can address safety issues associated with the introduction of advanced vehicle automation systems and autonomous vehicle concepts, e.g. driver interface concepts to maintain situational awareness, automated means to assess/anticipate traffic conditions and risk, strategies for the engagement/disengagement of automation, automated detection and management of conditions that require driver decision, e.g. 4 way stop, highway ingress/egress, traffic flow and inter-driver cuing.

3. Vehicle Electronics Reliability (New Topic for 2013): New concepts to assure the safe operation of motor vehicles due to increasing complexity of automotive safety-critical electronic control innovations, including novel approaches to system software test and validation, diagnostics and prognostics for intelligent vehicle health management, fail-safe and fail-operational mechanisms, etc.

4. Cybersecurity (New Topic for 2013):

New approaches to address safety issues associated with cyber attacks and electronic system vulnerabilities, e.g. hardening motor vehicles against potential cybersecurity threats, detection and prevention of unauthorized access or malicious attacks, capturing data from unauthorized access or malicious attacks to enable forensic examination, and alerting the driver to vehicle limitations due to attacks.

5. Cell Phone Distraction Prevention Technologies:

New system concepts which can help prevent cell phone related distractions while driving, e.g., novel in-vehicle systems which can detect cell phone use and provide a countermeasure.

6. Crash Avoidance Technologies: Driver assistance in critical situations, e.g. new concepts for crash warning systems, crash mitigation systems, crash prevention systems or new sensors which could provide inputs to such warning/mitigation or prevention systems.

7. Restraint System Enhancement: Systems to minimize injuries to vehicle occupants during a crash, e.g. vehicle interior design, enhancements to seatbelts, airbags, head restraints, integration of pre-crash sensors to optimize restraint performance, occupant position sensors, etc.

8. Post Crash Safety: Vehicle and triage enhancements that improve post crash injury prevention and treatment, e.g. automated crash notification, crash severity prediction, minimizing fuel leakage, fire mitigation, advanced bystander care, and automated crash scene measurement and reporting etc.

9. Impaired Driving Countermeasures: Systems to reduce impaired driving, e.g. ignition interlocks, passive drug and alcohol sensors, etc.

10. Crash Compatibility: Improved protection for occupants in vehicle-to-vehicle collisions, e.g., by use of new energy-absorbing structures, improving geometric alignment, by optimizing the energy absorption during crash etc. Intrusion caused by over-ride and under-ride could be improved e.g., adaptive and active bumper heights, composite research, ultra-light steel, etc.

11. Distraction Mitigation: New technologies to lessen driver distraction and minimize workload e.g., methods to detect distracted drivers, interfaces to influence drivers distracting behaviors, methods to adjust displays based on workload, etc.

12. Vision Systems: Innovative vision systems to improve visibility and conspicuity to detect other vehicles, people, objects and other hazards in the traffic environment etc.

13. Dummy Design and Instrumentation: New crash dummy/dummy component designs or advanced instrumentation for expanded injury assessment capabilities in all body regions.

Student Competition Details

CATEGORY DESCRIPTIONS Cont.

14. Pedestrian Crash Avoidance or Injury Mitigation:

Technologies to sense pedestrians or pedal cyclists in the vehicle's travel path may reduce the risk of a pedestrian-to-vehicle crash. Also, redesign of passenger vehicle structures or deployable devices to minimize pedestrian / pedal cyclist's injuries are sought to comply with newly approved international regulations.

15. Test Devices and Test and Evaluation Procedures:

Innovative full system test and evaluation procedures by which effectiveness of safety countermeasures and full system benefits could be assessed.



JUDGING CRITERIA

By October 15, 2012, the competition coordinators will each select a panel of three judges to review the team entries from each of the respective regions or countries. On November 13, 2012, selected teams who will participate in the regional design evaluation will be notified. During March 11-22, 2013, a panel of judges will visit the selected teams' universities to evaluate the developed safety concept and functional design model. The panel of judges may consist of both the government and industry automotive safety experts who will select the finalists from their respective jurisdictions. The final competitors at the ESV Conference in Seoul, Korea will be among the winners from each regional jurisdiction.

Thus, the final competitors will include a maximum of 3 teams per region.

In Seoul, Korea an international panel of judges will select a first-place winner team and a runner-up team. The international panel will consist of judges from each geographical region (Asia-Pacific, Europe, and North America). The competition coordinators will select leaders in the field of automotive safety in their respective regions who plan to attend the 23rd ESV Conference to serve as international judges for the final judging.



Student Competition Details

INTERNATIONAL COMPETITION

Students must meet all requirements in order to enter.

Final judging for this competition will take place during the 23rd ESV Conference, May 27-30, 2013, in Seoul, Korea.

The finalist teams will be required to give a 15 minute oral PowerPoint presentation during a special technical session for students at the conference. Each team's presentation should be a stand-alone detailed description that clearly shows the team's knowledge of the subject, and should give the judges a positive overall impression.

During the exhibition the international panel of judges will evaluate each team's prototype. Each team will have 10-minutes (maximum) to present and demonstrate the functional model. The same criterion that was used to judge the regional competition will be used to judge the finalists.

Winning teams will be presented with a plaque by a representative from the U.S. Department of Transportation / NHTSA and a representative from the 23rd ESV Conference Organizing Committee in Seoul, Korea.

Competition Flow Chart

Teams are selected to develop a conceptual and functional model, and prepare a report.



Student Competition Details

OVERALL SCORING SCHEMA

SCORING CRITERIA FOR ENTRY SUBMISSION (ABSTRACT):

Potential impact on safety problem being addressed
30 points

Originality
25 points

Practicability of creating a functional scale model
25 points

Supporting details, quality, technical depth
20 points

100 points total

SCORING CRITERIA FOR REGIONAL AND INTERNATIONAL FINALISTS:

Judging of each team's project, including their functional models and reports, will take place at each team's respective college or university in March 2013. Team reports must be submitted in English and no more than 3,000 words (approximately six pages) in length.

Judges will view a presentation of the functional models and review the written reports. The following criteria, for both the regional and final competitions, will be considered, and judges will award points based on the following:

Potential impact on safety problem being addressed
40 points

Did the team address a safety problem?
How did the team test and evaluate its system?
What metrics did the team use?
What are the results of the testing?
Are conclusions presented clearly?
What potential or expected effects will the system have on traffic safety?



Originality
20 points

Functional scale model, physical presentation
20 points

Oral Presentation
10 points

Supporting details, quality, thoroughness, technical depth
10 points

100 points total

Students are encouraged to include the following in their report:

- Estimated safety benefits in terms of lives saved or crashes prevented.
- The percentage of the passenger fleet covered and the percentage of the problem being addressed by the proposed countermeasures.
- The cost/benefit relationship for the system if it were produced and in-use fleet wide.

Based on the competition criteria, a maximum of three teams per region will be invited to compete in the final competition at the 23rd ESV Conference in Seoul, Korea. Teams will be notified of the judging results on April 8, 2013.

Student Competition Details

COMPETITION REGIONS

There are three competition regions: The list of the coordinators and their addresses are given below:

REGION: ASIA PACIFIC

Coordinator for Japan

Kazuro Iwata
Society of Automotive
Engineering of Japan, Inc.
(JSAE) Group Leader: Professional
Development & Publishing Group
10-2 Gobancho Chiyudaku
Tokyo 102-0076, Japan
Email: iwata-sstdc@jsae.or.jp

Coordinator for Korea

TBD

Coordinator for Australia

TBD

REGION: EUROPE

Coordinator for Europe

Dominique Cesari, INRETS
European Enhanced Vehicle-Safety
Committee
24 Avenue Francois Mitterand
Bron Cedex, F-69675 France
Phone: 33-1-4721-42570
Email: Dominique.cesari@inrets.fr

REGION: NORTH AMERICA

Coordinator for the United States

Art Carter, NHTSA
ESV Student Competition Organizer
1200 New Jersey Ave. SE
Washington, DC 20590 USA
Phone: 202-366-5669
Email: Arthur.Carter@dot.gov

IMPORTANT DATES

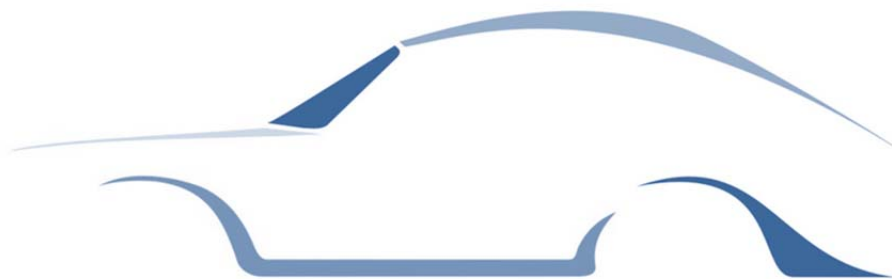
Entry Submission (Abstract) Deadline	October 29, 2012
Notification of Selected Regional Teams:	November 13, 2012
Regional Design Evaluation	March 11-22, 2013
Notification of International Finalists	April 8, 2013
Oral Presentation by International Finalists	May 29, 2013
First-place winner and runner-up selection and recognition	May 30, 2013

ESV CONFERENCE WEEK STUDENT SCHEDULE

Monday May 27, 2013	8:30 am-10:00am	Teams set up displays in exhibition area, and have their photographs taken.
	11:00am-6:00pm	Finalists are encouraged to have team members available to demonstrate functional scale models.
Tuesday May 28, 2013	8:30am-6:00pm	Team displays must remain in the exhibition area; however all students are not required to be present.
Wednesday May 29, 2013	8:30am-6:00pm	AM: Judges and conference participants will attend special technical session and listen to 15 minute oral presentations. PM: Judges will all congregate in the exhibition area for final judging of functional scale models. Finalists must be present and each team will have 10 minutes to present and demonstrate functional scale models.
Thursday May 30, 2013	1:00pm	Teams must be present. International first-place winner team and a runner-up team is recognized at the ESV closing ceremony.

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ESV STUDENT SAFETY

TECHNOLOGY DESIGN COMPETITION

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The program is correct at press time; however, the organizers reserve the right to alter the program if necessary.