

# 2025

## Traffic Control Device Student Challenge

### *Theme and Contest Rules Guide*



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# Traffic Control Device Student Challenge

## 2025 Theme: Innovative Traffic Control Device Solutions to Improve Roadway Worker Safety

### A. OVERVIEW

Now in its 8<sup>th</sup> year of competition, since its inception in 2017, the objective of the Traffic Control Device (TCD) Student Challenge is to promote innovation and stimulate ideas in the traffic control devices area with a goal to improve operations and safety. The challenge is sponsored by and conducted cooperatively by the Transportation Research Board (TRB) Standing Committee on Traffic Control Devices (ACP55) and the American Traffic Safety Services Association (ATSSA).

The TCD Student Challenge welcomes individual students or student teams from high schools, junior colleges, or universities (both graduate and undergraduate levels) who demonstrate an interest in transportation and possess knowledge of traffic control devices (TCDs). Students in relevant fields such as transportation-, human factors- and technology- related curricula are particularly encouraged to participate.

The TCD Student Challenge submittals will help to encourage innovation and creative thought in the transportation community. Contest participants will receive the opportunity to vet their designs in a public forum during the TRB Annual Meeting. The three winning submissions will be invited to receive additional recognition at the ATSSA Convention & Traffic Expo (additional details in Section D.4).

### B. PROBLEM STATEMENT

The theme for the 2025 TCD Student Challenge is: **Innovative Traffic Control Device Solutions to Improve Roadway Worker Safety**. Over the period from 2017 to 2021, data from the [National Work Zone Safety Information Clearinghouse](#) revealed an annual average of 108,000 work zone crashes nationwide, with the number of estimated crashes ranging between 94,000 and 123,000 annually. Correspondingly, data from the Bureau of Labor Statistics (BLS)<sup>1</sup> during the same time frame indicated that these crashes resulted in a total of 616 fatal worker injuries at road construction sites, with yearly fatalities varying from 108 to 135.

Roadway construction and maintenance are often carried out in complex environments near open travel lanes, placing workers at risk from construction vehicles and equipment, as well as the traveling public. Examples include:

- Workers deploying and removing TCDs amid ongoing traffic.
- The presence of heavy machinery operating near workers on foot.
- Increased risk of vehicle intrusions into the workspace due to distracted or impaired drivers.

While current practices, such as complying with the Manual on Uniform Traffic Control Devices (MUTCD) and utilizing devices like intrusion alarm systems, have proven effective in improving

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<sup>1</sup> Source: <https://workzonesafety.org/work-zone-data/worker-fatalities-and-injuries-at-road-construction-sites/>

roadway worker safety, there exists a critical need for innovative TCD solutions to further enhance worker safety.

The objective of the 2025 TCD Student Challenge is to devise an innovative approach to improving roadway workers safety through the use of TCDs. The TCD strategy can target the improvement of worker safety in various work zone operations, including construction, maintenance, and TCD setup or removal.

## C. GUIDELINES FOR PARTICIPATION

### C.1 Contest Eligibility

#### *Submitter Eligibility*

The TCD Student Challenge is open to individual high school, junior college, college or university student or teams of students. All that is required in terms of technical expertise of submitters is a keen interest in transportation and safety, along with an understanding of TCDs.

#### *Originality of Design*

The submissions must be an original design of the designer(s) or modifications to an existing industry-accepted design or product. In the case of a modification to an existing traffic control device or product, the original device or product that is being modified should be acknowledged.

#### *Individuals or Teams*

Individuals or teams can participate. Each individual or team submittal should have a lead contact specified by name and affiliation.

#### *Multiple Submittals*

Multiple submissions by individuals or teams from each school are allowed. Each idea will be considered independently and, as such, should be submitted in a separate submission package.

### C.2 Submittal Specifications

The submission packet can include drawings, photographs or other graphical renderings that can be encapsulated in a PDF file. Submittals are **limited to five pages in length**, including all text, graphics and cover page, packaged in a PDF format. Submitters are encouraged to provide a narrative in the five pages that explains the traffic control device or system of devices and describe how the submittal addresses each of the review criteria as specified below. The submitter should strive to communicate in a succinct manner.

Each submission packet must be submitted separately online at <https://bit.ly/TCDSApplication>. During the online submission process, you will be required to complete a submission form that includes your submission title; the name, affiliation, email and phone number of the team leader; and the name, affiliation, email and phone number of each team member. This form is not included in the submittal page total.

## D. REVIEW AND AWARD PROCESS

### D.1 Evaluation Criteria

Submissions will be evaluated based on the evaluation criteria below.

*Ability of the idea to address the problem.* The judges will review the submission and assess how well it mitigates the problem identified in the problem statement.

*Ease of understanding.* The judges will assess if the submission would be easily understood by the traveling public (e.g., motorists, pedestrians and bicyclists, as appropriate to the topic).

*Applicability.* The judges will assess the submission's applicability and transferability to various environments and roadways. For example, ideas that will only work in rural areas or in warm climates will not be scored as highly as designs that are appropriate for all area types, climates, etc.

*Feasibility for implementation.* The judges will assess the feasibility of the idea. They will consider the likelihood that the idea could be accepted by the transportation community and implemented broadly. The potential cost of implementation, the ease of implementation and the availability of materials can be part of the judges' considerations.

## D.2 Review Process

The TCD Student Challenge committee will screen each submittal to verify that it adheres to the contest guidelines. The committee will use the evaluation criteria to select up to 10 finalists to attend the TRB Annual Meeting.



## D.3 Judging of Finalists at TRB Annual Meeting

If selected as a finalist, the individual or at least one representative from the team is required to attend, at their own cost, the 2025 TRB Annual Meeting, which will be held Jan. 5-9, 2025, at the Walter E. Washington Convention Center in Washington, D.C. The finalists will present their submission during the TCD Student Challenge session. Additional presentation details will be provided to the finalists. The first, second and third place winners will be selected by a panel of judges at the TRB Annual Meeting. The judges will represent the practicing transportation community. More information about the TRB Annual Meeting can be found at [TRB.org/AnnualMeeting](https://www.trb.org/AnnualMeeting).

Finalists are **highly encouraged** to incorporate a visual model, such as 3D displays, prototypes, mock-ups and prototypes featuring programming and electronic components using platforms like Arduino or Raspberry Pi, in their presentation at TRB. However, visual models will not specifically be judged as part of the evaluation criteria.

## Presentations and Recognition at ATSSA's Annual Convention & Traffic Expo


After the three winners are announced at the TRB Annual Meeting, they will meet with an ATSSA representative to review the logistics for their travel to ATSSA's Annual Convention & Traffic Expo in Orlando, Fla., Feb. 28 – March 4, 2025. ATSSA will provide full financial support for travel to its annual event for one person per team. Additional team members are welcome to attend but their travel will not be covered. Registration costs will be covered for no more than two team members.



While at the ATSSA Annual Convention & Traffic Expo, the top three submissions will present their ideas during the Convention. Additional presentation details will be provided to the winners prior to the event. In addition, the top three submissions will have the opportunity to network with all manner of roadway safety personnel at various events, view the latest industry products and services and raise their level of engagement with high-quality education and information sessions. More information about ATSSA's Annual Convention & Traffic Expo can be found at [Expo.ATSSA.com](http://Expo.ATSSA.com).

#### D.4 Awards

First, second and third place will receive awards as specified in the following table. The top three winners will all receive an opportunity to present their concepts at ATSSA's Annual Convention & Traffic Expo.



**ATSSA's 55<sup>th</sup> Annual Convention & Traffic Expo is the event for roughly 4,000 roadway safety professionals and transportation officials.**

Place	"Micro Session" presentation	Travel expenses paid	Registration fees covered	Cash prize	Plaque
First	✓	One speaker	Up to two speakers	\$1,500	First place
Second	✓	One speaker	Up to two speakers	\$1,000	Second place
Third	✓	One speaker	Up to two speakers	\$500	Third place

#### Competition Scheduling

The following table presents key dates for submitting and participating in the TCD Student Challenge.

Milestone	Date
Submission Deadline	Oct. 1, 2024
Review of Submissions for Eligibility	Oct. 15, 2024
Notification of up to 10 submissions invited to TRB Annual Meeting	Nov. 1, 2024
Presentations and judging during the TRB Annual Meeting	Jan. 5-9, 2025
Announcement and recognition of winners	Jan. 5-9, 2025 (at TRB) <i>and</i> Feb. 28 – March 4, 2025 (at ATSSA)

#### E. CONTACT FOR ADDITIONAL INFORMATION

For questions about the TCD Student Challenge not addressed by this *Theme and Contest Rules* guide, please email [TCDChallenge@gmail.com](mailto:TCDChallenge@gmail.com). Additional information is also available at [ATSSA.com/TCDStudentChallenge](http://ATSSA.com/TCDStudentChallenge).