



2025 Regulations - Open Category

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A Administrative regulations

A 1 General regulations

- A 1.1 The regulations in this document apply to the open category of the Self Driving Challenge, Edition 2025.
- A 1.2 These regulations are subject to change if deemed necessary by the organization.

A 2 Competition overview

- A 2.1 During the Self Driving Challenge participating teams are tasked with making their vehicle drive autonomously as described in D 2.
- A 2.2 The extend to which the goal stated in A 2.1 has been achieved is accessed according to rules R 1 to R 3 of these regulations.
- A 2.4 For testing the solution during the challenge test days are organized according to D 3.
- A 2.5 Testing will take place at the RDW Test Centre in Lelystad.

A 3 Participation

- A 3.1 Participation in the Self Driving Challenge is done with a self-formed team.
- A 3.2 Participating teams are composed exclusively of students.
- A 3.3 There is no limit on the size of participating teams.
- A 3.3 Presence during test days and the finale is limited according to D 3.9 and D 3.10.
- A 3.5 The organization determines which teams participate in the Self Driving Challenge.
- A 3.6 Participants must at all times adhere to the safety rules as described in S 1, S 2 and S 3.

A 3 Support

- A 3.1 Participating educational institutions are responsible for providing support for their students.
- A 3.2 Limited support from the organization is available during the test days described in D 3.4

T Technical regulations

T 1 Vehicle characteristics

- T 1.1 The vehicle used for participating in the open category comply with the characteristics described in T 1.
- T 1.1 The minimum allowed width for the vehicle is 80 centimeters.
- T 1.2 The maximum allowed width for the vehicle is 160 centimeters.
- T 1.3 The minimum allowed length for the vehicle is 120 centimeters.
- T 1.4 The maximum allowed length for the vehicle is 300 centimeters.
- T 1.5 The maximum allowed height for the vehicle is 180 centimeters.
- T 1.6 The maximum allowed weight for the vehicle is 550 kilograms.
- T 1.7 The maximum weight as stated in T 1.6 is including all hardware required for autonomous operation.
- T 1.8 The vehicle must have four wheels making contact with the ground at all times.
- T 1.9 The vehicle must be capable of driving forward.
- T 1.10 The vehicle must be capable of reversing.
- 2. 11 The vehicle must steer using its front wheels.
- T 12 The minimum turning radius of the vehicle must be no more than 9 meters.
- T 1.3 The turning radius as described in T 1.12 is measured as the radius of the outer front wheel while taking a corner.

T 2 Drivetrain characteristics

- T 2.1 The drivetrain of the vehicle must be battery-electric exclusively,
- T 2.2 The combined total power of all electric engines forming the drivetrain must be no more than 15 kW.
- T 2.3 The maximum speed of the vehicle must be limited to 90 km/h.

T 3 Safety systems

- T 3.1 The vehicle must be equipped with a hydraulic mechanical braking system.
- T 3.x The braking system as described in T 3.1 must have a minimum deceleration of 5 m/s^2 (meters per seconds squared).
- T 3.2 The mechanical braking system can optionally be accompanied by an engine braking or energy recovery system.
- T 3.3 An emergency stop button must be present in or on the vehicle.
- T 3.4 The emergency stop button as described in T 3.3 must disconnect the high voltage system of the vehicle when pressed.
- T 3.5 The emergency stop button as described in T 3.3 must activate the mechanical braking system of the vehicle when pressed.
- T 3.6 The vehicle must be equipped with a remote emergency stop button.
- T 3.7 The emergency stop button as described in T 3.6 must disconnect the high voltage system of the vehicle when pressed.
- T 3.8 The emergency stop button as described in T 3.6 must activate the mechanical braking system of the vehicle when pressed.
- T 3.9 The vehicle must be capable of being controlled manually.
- T 3.10 Protruding edges on the vehicle must be rounded off with a minimum radius of 3.2 millimeter.
- T 3.11 The maximum speed of the vehicle must be software limited to the maximum speed allowed on track.
- T 3.12 The maximum speed as described in T 3.11 can be changed during the challenge.

T 4 Electrical safety

- T 4.1 The maximum voltage of the high voltage system cannot exceed 60 Volt.
- T 4.2 Electrical components must be grounded with at most 0.1 Ohms at 0.2 A.
- T 4.3 Electrical components and wiring must be shielded against direct contact.
- T 4.4 Electrical systems must have overcurrent protection.
- T 4.5 High voltage wiring must be colored orange and easily recognizable.
- T 4.6 Batteries must be fixated in the vehicle structure.
- T 4.7 Batteries must be protected against impact damage.

C Cyber security regulations

C 1 Risk assessment

- C 1.1 Teams are to comply with a subset of UN regulation 155 on cyber security as stipulated in section C of these regulations.
- C 1.2 Teams are to fill out a risk assessment evaluating the cyber security of their developed solution.
- C 1.3 A template for the risk assessment will be made available to teams at the start of the challenge.
- C 1.4 The risk assessment as described in C 1.2 is to be submitted before the finale of the Self Driving Challenge Edition 2025.
- C 1.5 Failure to comply with C 1.4 will result in exclusion from participating in the finale.

D Development

D 1 General

- D 1.1 At the start of the Self Driving Challenge an introduction with all participating teams will be organized.
- D 1.2 During the introduction the rules, goal, and outline of the challenge will be discussed.

D 2 Objectives

- D 2.1 Participating teams develop a software solution to make their vehicle as described in T 1 to T 3 drive autonomously in a simulated urban environment.
- D 2.2 The developed solution must be capable of driving the vehicle without exceeding lane limits in compliance with R 3.
- D 2.3 The developed solution must be capable of navigating the vehicle through turns without exceeding lane limits in compliance with R 3.
- D 2.4 Lane limits are indicated by continuous and broken white lines.
- D 2.5 The developed solution must be capable of detecting and waiting for traffic lights.
- D 2.6 The developed solution must be capable of detecting and adhering to speed signs.
- D 2.7 The developed solution must be capable of detecting and waiting for pedestrians crossing at pedestrian crossings.
- D 2.8 The developed solution must be capable of executing lane changes to evade static vehicles.
- D 2.9 The developed solution must adhere to right of way rules when encountering other traffic.
- D 2.10 The developed solution must be capable of navigating a predetermined route.

D 3 Test days

- D 3.1 During the challenge weekly test days will be organized.
- D 3.2 During test days teams can test their developed solutions.
- D 3.3 During test days teams collect data on and for their developed solutions.
- D 3.4 During test days members of the organization are present for answering questions regarding the development of the solutions.
- D 3.5 Test days are organized at the RDW Test Centre located in Lelystad.
- D 3.6 The organization can cancel, reschedule or organize additional test days.
- D 3.7 Participating teams are each allocated an equal amount of track time during test days.

- D 3.8 Timeframes are communicated to teams prior to each test day.
- D 3.9 A maximum of 10 persons per team are allowed to be present during test days and the finale.
- D 3.10 Exceptions to D 3.9 can be granted by the organization if requested.

R Results

R 1 General

- R 1.1 A finale will be used to assess which team developed the best autonomous driving software.
- R 1.2 The finale will be organized in compliance with R 2 of these regulations.
- R 1.3 The team performing best at the finale will be the winner of the Self Driving Challenge Edition 2025, Open Category.

R 2 Finale

- R 2.1 During the finale teams attempt to autonomously navigate a course containing challenges in compliance with D 2.
- R 2.2 Teams are to follow a route determined by the organization while navigating the course.
- R 2.3 The route to be taken during the finale will be announced at least 24 hours before the start of the finale.
- R 2.4 The Self Driving Challenge is won by the team setting the fastest completion time for a valid attempt.
- R 2.5 An attempt is valid if all challenges have been completed while adhering to the rules stipulated in R 3.
- R 2.6 If an attempt is invalidated the vehicle will be returned to the point directly after the last obstacle cleared.
- R 2.7 For the executing of R 2.6 teams must ensure the vehicle can be controlled as described in T 3.9
- R 2.8 Participating teams are allowed a maximum of two full attempts within a 7 minute timeframe.
- R 2.9 Partial retries after being invalidated do not count towards the maximum number of attempts stated in R 2.8.
- R 2.10 If no valid time is set the result is determined by the number of challenges completed before the lap was invalidated or the timeframe ended.
- R 2.11 If multiple teams complete an equal number of challenges the result is determined by the distance traveled before the lap was invalidated or the timeframe ended.
- R 2.12 The finale will take place at the RDW Test Centre in Lelystad.

R 3 Evaluation criteria

- R 3.1 While driving autonomously the vehicle is not allowed to exceed continuous lines.
- R 3.2 While driving autonomously the vehicle is not allowed to exceed broken lines.
- R 3.3 A line is exceeded if any tire is outside the line without making contact.
- R 3.4 Exceeding broken lines as stipulated in R 3.2 is allowed when evading a vehicle as described in D 2.8.
- R 3.6 When encountering a red traffic light, the vehicle must stop within 3 meters before the white line
- R 3.6b When stopping for a red traffic light, the vehicle must come to a complete standstill.
- R 3.7 When encountering a green traffic light the vehicle is allowed to continue driving.
- R 3.8 The vehicle is allowed to start driving when a traffic light turns green.
- R 3.9 When approaching a speed limit sign, the vehicle must drive at or below the indicated limit before passing the sign
- R 3.10 When approaching a pedestrian crossing with a pedestrian present, the vehicle must stop or reduce speed.
- R 3.11 The vehicle must not come closer than 2 meters to a pedestrian crossing while a pedestrian is crossing or waiting to cross.
- R 3.12 A dummy will be used as a pedestrian in situations described in R 3.10 and R 3.11.
- R 3.13 When approaching a stationary vehicle, the vehicle must complete the lane change at least 3 meters before reaching it.
- R 3.14 After passing a stationary vehicle, the vehicle must perform a lane change to return to the right lane
- R 3.15 When encountering traffic coming from the right, the vehicle should give right of way.
- R 3.16 R 3.15 does not apply at intersections regulated by traffic lights.

S Safety Regulations

S 1 Operating the vehicle

- S 1.1 Before activating the vehicle's high voltage system teams must first assign an operator for the emergency stop described in T 1.3.
- S 1.2 The emergency stop is to be activated whenever the developed solution fails to comply with the evaluation criteria as stated in R 3.
- S 1.3 Operating the vehicle on track is only allowed if a member of the organization is present.
- S 1.4 Prior to operation the vehicle will be checked by a member of the organization.
- S 1.5 Operation of the vehicle is only allowed after it has been released by a member of the organization.

S 2 Track safety

- S 2.1 When not driving autonomously participants are allowed to be present in the vehicle to control it.
- S 2.2 When driving a vehicle without a rollover structure the use of a ECE 20.05 certified helmet is mandatory.
- S 2.3 Helmets compliant with S 2.2 will be provided by the organization.
- S 2.4 It is not allowed to walk or stand in front of the vehicle when it is powered on.
- S 2.5 A track coordinator is assigned by the organization for each on track event.
- S 2.6 Participants must adhere to any instructions given by the track coordinator as per S 2.5.

S 3 Communication

- S 3.1 For communication with the track coordinator portable radio transceivers are supplied by the organization during on track events.
- S 3.2 Radio communication is to be kept concise and relevant.