

Not-a-Boring Competition 2025

Abbreviated Rules and Requirements

Last Updated May 2024



Teams at the 2024 Not-a-Boring Competition at Hyperloop Plaza in Bastrop, TX. March 2024

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Introduction

Created by Elon Musk, founder of Tesla and SpaceX, The Boring Company (TBC) creates safe, fast-to-dig, and low-cost transportation, utility, and freight tunnels. TBC's mission is to solve traffic, enable rapid point-to-point transportation, and transform cities. In September 2021, TBC hosted the first Not-a-Boring Competition (NaBC), which challenged engineers to build tunnel boring machines (TBMs) in an effort to accelerate innovation in tunneling technology. Talented teams from around the world answered the call and demonstrated innovative tunneling technology.

This year, TBC is again inviting teams to design, build, and race their own tunneling machines!

For the second year in a row, TBC is also hosting several Mini Competitions which aim to provide a lower barrier-to-entry, to rookie and pre-collegiate teams, who want to get involved with NaBC. The rules for all will be included in the same document, abbreviated here and released in full to registered teams soon. Visit boringcompany.com/competition to register your team now!

General Information

This document does not represent the full scope of the rules governing the Not-a-Boring Competition. Rules are subject to change.

Main Event

Full Competition teams in the 2025 Not-a-Boring Competition will compete across 4 categories, in order of priority:

1. Fastest to complete a horizontal tunnel (Champion Award)
2. Innovative design, build, or test (Innovation Award)
3. Most accurate guidance and navigation system (Accuracy Award)
4. Most impressive design, build, or test by a rookie competitor (Rookie of the Year Award)

Competitors in all categories should design a tunnel boring machine meeting the following top level requirements. Your machine shall:

1. Dig a tunnel with a cross section of at least 0.2m^2 (equivalent to a circular tunnel cross section of 0.5m in diameter)
2. Be capable of following a nominal tunnel alignment (tunnel path) which meets the following criteria but is otherwise up to the team:

- a. The straight-line distance between the tunnel ingress (entrance portal) and egress (breakthrough portal) must be at least 30m* between points where the cutterhead (or equivalent) face is fully underground
- b. The TBM should breakthrough within 0.5m of the nominal alignment
 - i. Deviations from the nominal breakthrough location exceeding 0.5m will be penalized in dig time, but not disqualified
- c. The tunnel crown (top of the supported tunnel) must reach a depth of greater than 0.5m at its deepest point
- d. The maximum depth of the tunnel crown is up to the team (within reason)
- 3. Be of your own design, including any supporting equipment
 - a. You will be asked to provide a list of out-of-house manufactured assemblies and provide evidence of collaborative design at minimum. During Competition Week safety inspections, teams will be expected to have in-depth knowledge of the assembly and operation of all out-of-house manufactured assemblies (hydraulic power units, electrical enclosures, etc.)
- 4. Be monitored, controlled, and powered according to the following criteria:
 - a. The machine's 6 degree of freedom (6DOF) state including position and orientation must be reported at all times
 - b. Explosive and flammable gasses shall be monitored and if detected, the machine enter a safe and shutdown state
 - c. Report relevant telemetry at a rate of at least 0.1 Hz
 - d. Be remotely controlled from the surface
 - i. No human or animal shall ride in any tunneling machine or in any in tunnel transportation device during the competition or during any pre-competition access
 - e. Not utilize combustion engines or explosive materials

* TBC will allow teams to reduce the overall length of their tunnel to match their expected capabilities. For example, if a rookie team believes a realistically achievable tunnel length is 10m, it is allowed to manufacture a machine that can only tunnel this length. The design of the machine (on paper) must still be capable of completing a 30m tunnel.

In the event that no team is able to finish the full 30m tunnel, the team which tunnels the farthest will receive the Champion Award. Additional points will be given (particularly relevant to the Accuracy Award) to a team which demonstrates an underground change in machine heading. In all categories, unanticipated disturbance of the surface (settlement or heave) due to your machine's tunneling operations will result in a deduction.

Mini Competitions

Mini Competition teams will be competing for the same awards as Full Competition teams described above. Teams may choose to compete in one of three categories, which shall meet the below top level requirements as applicable by competition category.

Digging Mini Competition

Create an innovative soil excavation system for a TBM by designing and building a machine which meets the following requirements. Your machine shall:

1. Complete a vertical bore with a cross section of at least 0.2m² (equivalent to a circular cross section of 0.5m in diameter) to a depth of at least 1m
2. Be of your own design, including any supporting equipment
3. Be monitored, controlled, and powered according to the following criteria:
 - a. Explosive and flammable gasses shall be monitored and if detected, the machine enter a safe and shutdown state
 - b. Report relevant telemetry at a rate of at least 0.1 Hz
 - c. Be remotely controlled from the surface
 - i. No human or animal shall ride in any tunneling machine or in any in tunnel transportation device during the competition or during any pre-competition access
 - d. Not utilize combustion engines or explosive materials

Tunnel Lining Mini Competition

Create an innovative tunnel support system for a TBM by designing and building a machine which meets the following requirements. Your machine shall:

1. Deploy and support a reinforcement system which supports dirt placed and settled on top of it within a test pit
2. Be of your own design, including any supporting equipment
3. Be monitored, controlled, and powered according to the following criteria:
 - a. Report relevant telemetry at a rate of at least 0.1 Hz
 - b. Be remotely controlled from the surface
 - i. No human or animal shall ride in any tunneling machine or in any in tunnel transportation device during the competition or during any pre-competition access
 - c. Not utilize combustion engines or explosive materials

Navigation Mini Competition

Create an innovative guidance and navigation system which conforms to the approximate constraints of a full size TBM, demonstrated on a small autonomous rover. Your machine shall:

1. Be capable of autonomously navigating an above ground obstacle course in the field made up of obstacles and checkpoints of varying sizes and shapes
 - a. Utilize sensors available to tunnel boring machines underground, specifically excluding forward facing ranging sensors, cameras, and sensors which would not be available underground. You will be asked to justify that your proposed navigation system is applicable to a full-sized tunnel boring machine
2. Be of your own design, including any supporting equipment
 - a. As the focus of this Mini Competition is on the guidance and navigation system specifically, an off-the-shelf solution for the rover is acceptable. Teams will be expected to have in-depth knowledge of the assembly and operation of all out-of-house manufactured assemblies (hydraulic power units, electrical enclosures, etc.)
3. Be monitored, controlled, and powered according to the following criteria:
 - a. Report relevant telemetry at a rate of at least 0.1 Hz
 - b. Be capable of receiving a remotely commanded E-Stop signal from a surface ground control station
 - c. Not utilize combustion engines or explosive materials

Eligibility

Both student and non-student teams are eligible to enter the competition so long as they adhere to the following rules:

1. Student led teams must have a Faculty Adviser
2. Teams may consist of students from multiple schools, or individuals from multiple companies
3. The team structure is flexible with a minimum number of 2 team members and no maximum number (within reason)
 - a. Team member lists must be submitted with each deliverable and approved by the team's registered point of contact

For any question regarding eligibility, please contact us prior to the competition via email at competition@boringcompany.com

Changes in your competition category will be accepted up to 1 week prior to the Preliminary Design Briefing.

After registering your team, with the exception of technical questions, communications to and from The Boring Company should only be made from the address of your team's registered point of contact and to competition@boringcompany.com.

Recommendations and Additional Notes

TBC encourages teams to:

1. Design, build, and test as many (all) of their machine's systems in-house (within reason)
2. Minimize dependency on heavy machinery during competition week (no cranes will be provided). Any time needed to dig a launch or retrieval pit by TBC staff will be added to the overall tunneling time
3. TBC will provide, at a minimum, small forklifts and telehandlers to be operated by TBC employees (but at the direction of teams). If a team supplies appropriate certifications, they may bring and operate their own equipment
4. Simplify as much as possible, especially your launch setups
5. Lean on the experience of industry, academia, and veteran competition teams, but always verify that the information you receive is relevant to your team's specific operational circumstances
6. Consider the budgeting and team management challenges of the competition in addition to the technical and engineering challenges. Manufacturing and testing your designs takes significant planning, budgeting, and team member input.

Competition Format

Once formed, interested teams must apply for the competition using the form on boringcompany.com/competition. Applying teams are screened on their eligibility per the requirements outlined previously. Once screened, teams will receive additional information including requirements for the first milestone (Preliminary Design Briefing) and a non-abbreviated version of this document.

Ultimately, teams selected to advance to Competition Week must successfully pass the following pre-competition milestones where they will be judged by TBC advisors:

1. Preliminary Design Briefing
2. Final Design Package
3. Final Design Presentation
4. Mining Readiness Review

After passing these milestones, selected applicants and their machines will compete during Competition Week. During Competition Week, teams will conduct several tests and additional

briefings on their machines and operations to prove safety and reliability to TBC advisors. After completing these final assessments and passing the safety and reliability check, at TBC's discretion, teams will be allowed to test their tunneling machine on Dig Day.

The Boring Company, at its sole discretion, may allow or disallow entrants from accessing the site or from participating in the competition.

Competition Schedule

The 2025 Not-a-Boring Competition schedule will be updated and amended throughout the season. Dates are subject to change, No Earlier Than (NET) milestone dates are provided below:

NET Date	Milestone
Jun. 8th, 2024	Unabbreviated Rules and Requirements document released to teams
Jul. 14th, 2024	Team Overview and Plans Briefing
Sept. 1st, 2024	Preliminary Design Briefing
Nov. 11th, 2024	Final Design Package
Winter 2025	Final Design Presentations
Spring 2025	Mining Readiness Review
Spring 2025	Competition Week

All teams, regardless of which competition category they are competing in, will follow the same competition schedule.

Revision History

Rev.	Date	By	Description
A	May 2024	CK, CS	Initial Release